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ABSTRACT

This notebook accompanies a videotape series produced by Project BEST (Basic Education Skills through Technology), a federally funded cooperative effort involving federal, state, and local governments and the private sector in planning and using information technologies to improve basic skills instruction. Intended for state and local personnel using or planning to use information technology in schools, the materials are resource supplements for state and local staff development programs. Separate sections address the three major types of Project BEST print and nonprint products. The videotape module guides section briefly describes the four 30-minute videotapes, which depict school-level experiences in introducing microcomputers into the educational system. A discussion leader's guide for each module highlights its objectives and offers suggestions for organized viewing and discussion. The second section presents profiles of each school district shown in the videotape modules and provides an overview of the district's experiences in introducing microcomputers in the schools, the name of a district contact, and a list of available written materials about the district's technology activities. Finally, materials on Project BEST teleconferences and videotape newsletters are provided, including supporting documents and suggestions or how to use the materials in staff training. (LMM)

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A USER'S GUIDE TO PROJECT BEST* PRODUCTS: PRINT AND NONPRINT

By

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BEST COPY AVAILABLE

Summer 1983

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U.S. Department of Education
Washington, D.C.

*Basic Education Skills Through Technology

IR010871

The materials referenced in this notebook were prepared by the staff of Project BEST:

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Acknowledgements

Special thanks to the staffs of the schools in Albany, Ohio; Ann Arbor, Michigan; Cincinnati, Ohio; Cupertino, California; Fairfax County, Virginia; Fort Madison, Iowa; Plains, Montana; and Wayne, New Jersey. They opened their schools to us and provided an opportunity to observe and describe their experiences using microcomputers in schools. Without their assistance, we could not have produced the video modules or the school district profiles which are integral to this User's Guide.

The 41 State Departments of Education, their designated State Team Leaders, and State Team members merit recognition for their belief, support, informational contribution, active participation and involvement in what became Project BEST--a network of people learning and sharing current experiences about the new information technology with other people. It is in their hands that the materials, knowledge, and information embodied in this notebook and companion videotapes will take on new meaning for countless school practitioners once Project BEST as a formal entity completes its contract with the U.S. Department of Education on September 30, 1983.

Thanks also to Leroy London, Terry Skura, Barbara Sheridan, Cheryl Petty Garnette, and Carol Wolinsky of the Project BEST staff for working cooperatively with me and other members of the staff in writing the descriptive narrative in the notebook and organizing its production. In particular, I acknowledge the technical contributions of Carol Wolinsky and Leroy London for taking the leadership in accomplishing this task.

I wish to express my appreciation also to Ann Erdman, the Department of Education Project Officer and Frank Withrow, Director of the Division of Educational Technology in the Office of Learning and Library Technologies. Without their support, this Project would not have been possible.

Special thanks are extended to Lewis Rhodes, Associate Director for Project BEST representing Applied Management Sciences, Inc., and Dolores Deardorff, Associate Director for Project BEST, representing Maryland Instructional Television. Jointly with AECT and me, these individuals formed the triangular consortium known as "People to People--the B.E.S.T. Approach."

Henry T. Ingle
Director, Project BEST
Summer 1983

INTRODUCTION

Purposes of This Notebook

This notebook is a companion piece to a series of video tapes produced by Project BEST (Basic Education Skills through Technology), a federally-funded cooperative effort involving federal, state, and local governments with the private sector in planning and using modern information technologies to improve basic skills in teaching and learning. The project provided current information, training, and technical assistance to 41 State Education Agencies. It also created a national network of states and professional organizations that fostered an exchange of ideas, people, products, and information about the use of technology for educational improvement.

This notebook and the video tapes were developed for state and local school personnel who use or plan to use information technology, such as the microcomputer, in their school programs to enhance learning. The materials are resource supplements for state and local staff development programs. All video and print materials are in the public domain and may be reproduced. To facilitate reproduction, master copies of each print item are included in plastic packets accompanying each section of the notebook.

The Project BEST products share the experiences of practitioners who have introduced the new information technologies, particularly microcomputers, in schools. They are designed to:

- encourage users to continue to implement technology in their schools
- help users understand that the problems they are facing are similar to those of other educators
- help users learn from the experiences of persons shown in the video tapes.

Content of This Notebook

This notebook is divided into three major sections, each addressing the three major types of Project BEST print and nonprint products.

- Video Module Guides--this section briefly describes the four 30-minute video tapes (modules) developed by Project BEST to depict school-level experiences in introducing microcomputers into the educational system. A discussion leader's guide for each module is provided. The guides highlight the objectives of the modules and offer suggestions for organized viewing and discussion. They may be used by SEA or local educators in organizing staff development programs for school practitioners and interested citizens.

- School District Technology Profiles--this section contains a written description of each school district shown in the video modules. Each profile provides an overview of a district's experiences in introducing microcomputers in the schools, the name of an individual in the district who can provide further information, and a list of available written materials about the district's technology activities.
- Descriptions: Other Video Materials--in addition to the video modules, Project BEST conducted several video teleconferences and telecast two video newsletters. This section contains materials on these video elements, including supporting documents and suggestions on how to use the video materials in staff training.

How to Use the Project BEST Materials

The products were designed to supplement ongoing staff development and training programs. The materials can be used with various groups, including:

- State education agency personnel who need training materials in working with local school personnel
- Local school personnel, such as teachers, administrators, and curriculum specialists who are seeking resources to help solve problems in introducing technology in the schools
- Community and industry representatives and other members of the general public who wish to become familiar with the issues facing educators as they incorporate technology in their schools.

We recommend that you preview all video materials you plan to use and structure a discussion of local concerns and issues around the video products. The guides included in this notebook are designed to help you plan your local program.

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Basic Education Skills through Technology
Project BEST
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American Association of School Administrators
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National Association of State Educational Media Professionals
National Association of State English and Reading Supervisors
National Council for Accreditation of Teacher Education
National Council of Teachers of English
National Council of Teachers of Mathematics
National Governors Association
National Science Foundation
Steering Committee of State Basic Skills Coordinators

MEMORANDUM

TO: State Team Leaders and Teleconference Participants

FROM: Henry T. Ingle, Project Director

SUBJECT: May 18 Teleconference Activities

DATE: May 6, 1983

This information packet contains a number of items designed to familiarize you with the video materials you will be viewing in conjunction with Project BEST's May 18 teleconference--"Becoming Literate with the New Technology." The guide includes:

- A brief overview of the videotape, "Learning and Teaching ABOUT Computers"
- A detailed content outline of the videotape
- A Users' Guide to accompany the videotape
- An outline of the video newsletter
- A listing of projects and activities highlighted in the video newsletter
- An outline of the teleconference
- Short biographies on the panelists who are participating in the teleconference
- A selected bibliography of computer literacy resources that Project BEST has encountered while researching the topic for "Becoming Literate with the New Technology"
- A series of one-page profiles of the computer literacy activities in the districts documented in the videotape
- An article outlining the May 18 activities reprinted from the April issue of Instructional Innovator
- A paper entitled "Learnings Paper No. 1: Video as a Medium for Sharing Experiences"
- A feedback sheet to record your comments and thoughts on the May 18 Teleconference

It is important that you read this print packet before participating in the May 18 teleconference. Use your judgement as to which section you would want to reproduce for your state team and the audience that will participate in the teleconference with you.

Items of particular significance are included in a separate group on yellow paper. They are:

- The detailed content outline of the videotape, "Learning and Teaching ABOUT Computers"
- The printed Users' Guide which complements the videotape
- The Instructional Innovator article on the May 18 teleconference
- The directory listing the names and addresses of people to contact for information about items mentioned on the video newsletter.

These, we feel, would be the four most useful items to the viewing audience. You might also want to provide copies of the printed case profiles on each school district highlighted in the video module.

In order to gain the most from the May 18 teleconference, it is important (and I underscore the word important) to view the videotaped module on computer literacy that will be fed to your PBS station via satellite on May 17. It is 30 minutes long and will be accompanied by the second Project BEST video newsletter (22 minutes). The viewing of these two pieces should be among the first order of business when your team convenes on May 18 for the teleconference.

Please remember to complete the enclosed feedback forms and return them to us by May 30. Happy viewing!

REMINDER..........REMINDER..........REMINDER.........REMINDER!!!!!

PBS SATELLITE FEED on MAY 17 of BEST Video Module
and Video Newsletter for May 18 Teleconference

Outlined below are the final technical specifications needed by you and other interested individuals in your state planning to do your own taping of the May 17 Project BEST satellite video feed of the Computer Literacy Module and the second issue of the BEST Video Newsletter. PBS stations participating with Project BEST State Teams have been notified of this information by us through the PBS ConferSat Office in Washington, D.C.

FEED TIME:	TUESDAY, MAY 17 11:07 AM to 12 NOON (EDT)
SATELLITE TRANSPONDER:	WESTAR IV, TRANSPONDER 12-D
LENGTH OF TIME:	53 MINUTES/COLOR PLAN TO RECORD ON A 60-MINUTE VIDEO CASSETTE
ITEMS BEING FED:	TWO
	1.) VIDEO MODULE (30 MINUTES): "LEARNING AND TEACHING ABOUT COMPUTERS
	2.) MAY VIDEO NEWSLETTER (23 MINUTES): UPDATE on a number of new products, activities, services, and information about PROJECT BEST, with a special emphasis on computer literacy material. The information is current and therefore has a use expectancy of 30 to 45 days.
BEST TELECONFERENCE:	WEDNESDAY, MAY 18 2:30-3:30 PM (EDT) WESTAR IV, TRANSPONDER 12

"Becoming Literate with the New Technology"

CALL-IN Number for Teleconference: 301/337-4044

It is important that all teleconference participants screen the 30-minute module, "Learning and Teaching ABOUT Computers," before joining the BEST teleconference on May 18. The module as a complete unit will not be shown in the teleconference. The teleconference interaction and question and answer segments will focus on clarifying and amplifying concepts, ideas, approaches, procedures, etc. which the module has triggered in your own mind. Therefore, you need to see the module beforehand.

THE VIDEOTAPE

"Learning and Teaching ABOUT Computers," a 30-minute videotape, documents the personal experiences of teachers and administrators in six different school districts: Albany, Ohio; Ann Arbor, Michigan; Plains, Montana; Cincinnati, Ohio; Fairfax County, Virginia; and Cupertino, California. It presents their views on developing proficiency with microcomputers, how and why computer literacy was introduced in their school district, and what they have learned as a result. Among these districts, there is likely to be one that represents a situation familiar to you.

This videotape deals with several aspects of computer literacy. The first segment, "Computer Literacy: What Is It?," is based on the premise that before a computer literacy program can be designed and implemented, the term must be defined. This portion of the videotape examines what computer literacy means in the school districts we visited. The following segment focuses on staff development and the various routes teachers, administrators, students and their parents are following to learn about microcomputers--and in particular, how school districts are facilitating the process. It looks at the different inservice programs for both teachers and administrators, the computer literacy curricula being implemented for students in grades K-12, and the adult education programs that parents in all school districts are requesting.

The videotape does not advance any one particular model or approach to computer literacy. Rather, it suggests that there are many approaches, each suitable for a variety of situations. The videotape and the interactive teleconference discussion should help you to determine which approach is most appropriate for you. The information may confirm some of your views; it may also challenge your beliefs. Either way, we hope these video programs stimulate thought and discussion on computer literacy and give you some clues about what to anticipate in planning for and implementing a computer literacy program in your school district. It is a process that has a beginning...but no end.

CONTENT OUTLINE

PROJECT BEST VIDEO MODULE NO. 2

"LEARNING AND TEACHING ABOUT COMPUTERS"

MAY 18, 1983

I. "Computer Literacy: What Is It?" - In Pursuit of a Definition

   A. Different things to different people

      1. More than a term--a concept with several ingredients
      2. Knowing what a computer can and cannot do
      3. Being aware of a computer's impact, uses, potential
      4. An ease, familiarity, and comfort with the equipment
      5. The ability to accomplish what you want

   B. A basic skill...similar to reading, writing, and arithmetic

   C. Consists of four levels/stages:

      1. Awareness
      2. Comfort
      3. Use (as a tool for specific purposes)
      4. Proficiency

   D. More than just programming/ programming may or may not be necessary

II. A. How do teachers learn about microcomputers? How are schools teaching them?

      1. Hands-on experience is a must
      2. Clear, effective users' guides and instructional manuals
      3. Talking to peers about problems and learnings
      4. Formal courses at colleges, universities, or district inservice
      5. Taking district computers home on holidays and weekends
      6. Networks of resource people to call on after initial workshop

   B. What about administrators?

      1. Literacy for administrators is different from literacy for teachers
      2. Learn best from and among peers
      3. Programming is not necessary for everyone
      4. Must be positive about microcomputers for a computer literacy program to be successful

   C. What about students?

      1. Generally self-motivated; no fear of machines
      2. Experience in computers is gleaned at home
      3. Programming aids logic and problem-solving skills
      4. Programmable devices help them to understand computers
      5. Not all kids need to learn programming
      6. Curriculum often teaches "about" rather than "with" computers because of hardware shortages

7. Computer literacy curriculum can either be taught as a separate course or integrated into the existing subject areas
8. Computer literacy at the high school level needs to complement or expand on what's happening to students at the elementary and intermediate levels

D. What about parents?

1. Parents are eager to learn about microcomputers
2. Teaching parents and students together is effective
3. Parent volunteers are valuable assets to a computer literacy program

III. Advice to Others

A. Involve teachers from the beginning

B. Microcomputers won't solve all problems

C. Plan carefully and for effective use

D. Maintain grass roots movement

E. Use teachers as expert resources

F. Basic literacy should not be sacrificed in favor of computer literacy

USERS GUIDE

PROJECT BEST VIDEO MODULE NO. 2

LEARNING AND TEACHING ABOUT COMPUTERS

MAY 18, 1983

The video module that this guide is designed to accompany presents the computer literacy experiences of personnel from six school districts. These districts were chosen because they are reflective of the size, geography, personal experience, and economic diversity of school districts across the United States that have gone into the use of microcomputers over the past two years. They include: Albany, Ohio; Ann Arbor, Michigan; Cincinnati, Ohio; Cupertino, California; Fairfax County, Virginia; and Plains, Montana.

The video module was designed to be used in conjunction with training activities for the four audiences identified in this guide. Together, these groups represent all persons involved in the development of computer literacy programs in school districts.

The objectives of this module are to:

- Depict the stages and ways in which adults and children in the schools are becoming comfortable with and adapting to new technologies
- Familiarize the audience with the current array of practitioner issues, concerns, and controversy relating to the implementation of computer literacy programs in schools
- Help viewers understand the reasons why schools are currently organizing for computer literacy and how and why they are operationally defining the term.

GENERAL DISCUSSION

- What does computer literacy mean to you? View the module to see what it means to others.
- How are schools in your district teaching computer literacy? As you watch the module, notice how other school districts are addressing this topic.
- What are the major problems/concerns now facing you as you attempt to address the area of computer literacy? The module presents ways that others have addressed it. Look for these as you view the module.

ADMINISTRATORS

Pre-viewing

- What are some of the constraints/variables related to the development of computer literacy programs in your school(s)? As you view the module, notice how others are overcoming their constraints and are controlling their variables.
- How is your school system defining the concept of computer literacy? In viewing the module, determine the extent to which your understanding of the concept is similar/different from those presented.
- List the major computer literacy issues and questions (in terms of management, instruction, and staff development) that your school(s) is now facing. Identify possible solutions as you view the module.

Post-viewing

- To what extent were your issues and questions addressed in this module? What other issues do you need to address and how might you address them?
- What refinements might you now consider making to your current understanding of the computer literacy concept?
- What types of administrative support might you provide your staff as they develop computer literacy programs?
- What level of computer literacy do your staff members have and how can their familiarity with the technology be increased?

CONTENT/CURRICULUM SPECIALISTS

Pre-viewing

- From the perspective of your curricular or content responsibilities, how would you define the computer literacy concept? View the module and determine how others have defined it.
- What staff development issues have you identified in implementing a computer literacy program? View the module and note the staff development issues addressed by others.

Post-viewing

- What refinements or modifications, if any, would you now consider making to your ideas of the computer literacy concept?
- What strategies might you use to help teachers view microcomputers as an instructional enhancement rather than an add-on?

TEACHERS

Pre-viewing

- How would you describe the manner and ways in which you are learning about microcomputers? As you view the module, compare your experiences with those shown.
- How are your students learning about computers? View the module and notice how other students are learning. Look for ways you might use these methods with your students.
- In the module, others are attempting to describe the computer literacy concept. What ideas do you have about the concept? How might you define it?

Post-viewing

- How might the use of computers become an enhancement to what you are now doing in your classroom?
- What are some activities you might wish to initiate for yourself and your students to enhance computer literacy levels?
- What are some ways in which you might involve parents in your computer literacy program?

PARENTS/COMMUNITY GROUPS

Pre-viewing

- How are the students in your school learning about computers? View the module to see how other students are learning about computers.
- View the module and discover areas where your support might be helpful to your school's efforts to develop a computer literacy program.
- What does the term "computer literacy" mean to you? View the module to find out what it means to others.

Post-viewing

- What are some activities in which you would like to engage in order to improve your computer literacy level?
- What are some ways in which you might support your school's computer literacy program?
- What does "computer literacy" mean to you now that you have seen the module?

THE VIDEO NEWSLETTER

The video newsletter will be broadcast on May 17 along with the videotaped module "Learning and Teaching ABOUT Computers." The newsletter is approximately 22 minutes long. It presents updates on publications, software, filmstrips, slides, videotapes and other programs and activities dealing with computer literacy. It also includes upcoming Project BEST activities and proposed new informational resources for use by participating BEST states. As before, the items in the newsletter have a suggested shelf-life of only 30 to 45 days. It is important that you take advantage of the information soon after you receive it. This packet also contains a listing of addresses to write for more information on these materials presented in the video newsletter. Do not rely solely on the newsletter for the source of the item you are interested in; the program moves too quickly to copy down addresses and phone numbers. Therefore, the attached listing of addresses and resources is an important complement to the video newsletter.

The diskettes demonstrated in the newsletter, offered through the ERIC Clearinghouse, will be mailed to you under separate cover before the May 18 teleconference.

Guide Sheet

Informational Products Announced on
May 18, 1983
Project BEST VIDEO NEWSLETTER

*1. Diskettes (2) from ERIC Clearinghouse Selected Information Resources from RIE and CIJE on Computer Literacy	Produced (for BEST State Teams) by: Dr. Donald Ely, Director ERIC Clearinghouse on Information Resources Syracuse University School of Education Syracuse, NY 13210
2. BEST NET Bulletin Board (Beginning June, 1983) Software Information Exchange	Available to BEST NET electronic mail users on an experimental basis. Source: Mrs. Bobby Goodson Computer Using Educators Box 18547 San Jose, CA 95158
3. Videotape of teleconference from New York "Computing Strategies for Success"	Carmen Paigo Center for Learning Technologies Media Network Cultural Education Center C-7 Albany, NY 12230 ($40)
**4. Books from State of Tennessee Department of Education Computer Skills Next: A Plan for Grades 7 & 8 Microcomputers in the Schools: An Educator's Guide	Dr. George Malo, Director Division of Research and Development Tennessee Department of Education 135 Cordell Hull Building Nashville, TN 37219
5. Handbook from Santa Clara County Office of Education Computer Education Handbook	Bonnie Pardue Microcomputer Center - Mail Code 237 Educational Development Center Santa Clara County Office of Education 100 Skyport Drive San Jose, CA 95115 ($25 + $5 Shipping and Handling)

6. Guide from Educational Software Evaluation Consortium 1983 Educational Software Preview Guide	Available to State Team Leaders--limit of one copy each upon request. Cheryl Petty Garnette Project BEST/AECT - Room 214 1126 Sixteenth Street, NW Washington, DC 20036 Other persons should contact: Kathy Parks TECC Clearinghouse - Software Library San Mateo County Office of Education 333 Main Street Redwood City, CA 94063
7. Book from the American Association for Higher Education Meeting Learners' Needs Through Telecommunications: A Directory and Guide to Programs	Marilyn Kressel, Director Center for Learning and Telecommunications American Association for Higher Education One Dupont Circle NW - Suite 600 Washington, DC 20036 ($40 to non-members)
8. Book from Office of Technology Assessment, U.S. Congress Informational Technology and Its Impact on American Education (Linda Roberts Case Studies)	Superintendent of Documents U.S. Government Printing Office Washington, DC 20402 ($8.00 #052-003-00888-2)
*9. Videotapes from Project BEST (Available after June 30, 1983) "Teaching WITH Computers--Now You're Cooking!" "Computerwares: Hard & Soft Decisions"	Producer: Project BEST/AECT - Room 214 1126 Sixteenth Street, NW Washington, DC 20036
*10. Guide from Project BEST (Available after June 30, 1983 to BEST State Teams) Users' Guide to Project BEST Products (Print and Non-Print)	Author: Project BEST/AECT - Room 214 1126 Sixteenth Street, NW Washington, DC 20036

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*Complementary copies have been, or shortly will be made available to each State Team Leader. Other interested persons should contact their own, or neighboring State Team Leaders. List of Leaders available from: Project BEST/AECT - Room 214
1126 Sixteenth Street, NW
Washington, DC 20036

**Complementary copies have been made available to each State Team Leader. Other interested persons should contact Dr. George Malo in Tennessee.

THE TELECONFERENCE

The call-in number for your questions during the one-hour interactive May 18 teleconference, "Becoming Literate with the New Technology," is:

(301) 337-4044

The teleconference will focus on five issues in computer literacy.

1. What is it?
2. How does it happen to educators?
3. Competencies, such as programming, that need to be addressed.
4. Ongoing support to staff beyond computer literacy workshops.
5. Issues surrounding a decision to integrate or offer computer literacy as a separate course in the existing curriculum.

Short clips from the computer literacy videotape will be shown on air to focus panel discussion and site call-in questions on the above 5 issues. Members of the panel will include Bobby Goodson, Computer Resource Teacher in Cupertino, California; Fran Gallagher, Program Analyst for Fairfax County Public Schools in Virginia; Marvin Veselka, Project BEST State Team Leader in Texas; and Jenelle Leonard, Assistant Director of Computer Literacy for the District of Columbia Public School System. Henry Ingle and Lew Rhodes of Project BEST will moderate the panel discussion, summarize and provide instant analysis of the major points.

You are strongly encouraged to view the May 17 videotape before the teleconference the following day. There will be a call-in segment of the teleconference during which you will have a chance to ask a question, live on the air, to the panelists. Consequently, previous familiarity with the contents of the videotaped module is necessary. The module in its entirety will not be shown on the teleconference. Viewers on site need to screen the module and engage in necessary discussion before joining the teleconference. We suggest you allow time to show the module several times (at least twice) to the assembled viewers, stop it at appropriate spots for discussion, etc., in a manner very similar to what you might experience in a training workshop meeting. In short, use the flexibility of the video cassette format to its optimum and become as familiar with the module as possible before participating in the teleconference activities on May 18.

THE PANELISTS

FRANCINE L. GALLAGHER

Francine Gallagher is the Program Analyst for Instructional Technology in the Department of Instructional Services for Fairfax County Public Schools in Fairfax, Virginia. She began teaching computer literacy in 1977 to elementary students and developed a curriculum for integrating computers into the elementary *Program of Studies*. She came to her present position in 1981. She is responsible for the preview and evaluation of software as well as coordination of the elementary computer literacy curriculum and teacher training courses. She received her B.S. in Elementary Education from West Chester State College in Pennsylvania in 1969 and will complete her Masters in Education, Curriculum and Instruction in June 1983 from Virginia Polytechnic Institute and State University. She is married and has three children.

BOBBY GOODSON

Bobby Goodson is a Computer Resource Teachers for the Cupertino Union School District in Cupertino, California. Prior to that position, she was a junior high school math teacher for 10 years. She is the author of the original computer literacy program first used in Cupertino in 1976. Mrs. Goodson is the president of Computer Using Educators (CUE), a California-based organization for people interested in the use of computers in education. CUE has a membership of 5,000 in the U.S., Canada, and abroad. In 1982, she was the recipient of the Distinguished Achievement Award for Leadership in the Advancement of Education through Technology, awarded by *Electronic Learning*. She also is the co-author of *Courseware in the Classroom*, published in 1983 by Addison-Wesley.

JENELLE V. LEONARD

Jenelle V. Leonard recently assumed responsibility as Assistant Director for Computer Literacy for the District of Columbia Public Schools. She has been an instructor at the Northern Virginia Community College in developmental reading and writing courses; a consultant in computer-assisted instruction at the Region IV Education Service Center in Houston, Texas; and a computer education consultant to the American Institutes for Research as part of its Project VIM--Video Interactive Media. She holds a B.A. from Houston-Tillotson and an M.A. in Educational Psychology and Reading from New York University

MARVIN VESELKA

Marvin Veselka, the State Team Leader for Project BEST in Texas, is the Associate Commissioner for Professional Support for the Texas Education Agency, where he is involved in several activities dealing directly with computer literacy competencies. In this position, he also oversees the implementation of teacher competency testing legislation and holds supervisory responsibilities for the state of Texas in inservice education, guidance services, school health services, school library and instructional television services, instructional computing applications and the Professional Practices Commission. He holds Bachelor and Masters degree in education and has been employed by the Texas Education Agency for over 13 years. He is married and has two children.

"Becoming Literate with the New Technology" Project BEST Teleconference—May 18

May 18 Teleconference Schedule* (EST)

2:15p.m.-2:30p.m.	Color bars and tones to adjust/tune monitors.
2:30p.m.	Opening/overview of teleconference topics
2:35p.m.	Introduction of invited guests.
2:37p.m.	Presentation of video module segments, call-ins, and discussion.
3:15p.m.	Interactive segment on "Feedback and Significant Learnings"
3:30p.m.	Closing

*On May 17 participating states will receive a 30-minute videocassette and video newsletter (transmitted via PBS on a closed-circuit basis) for screening by state site participants as the first order of business at each state meeting being convened in conjunction with the May 18 teleconference.

As the number of computers increases in schools across the country, the question inevitably arises: just how much do I need to know about this new information technology? During initial research efforts in Project BEST, we found that one of the major issues educators at both the state and local levels want addressed is clarification on computer literacy—what it is, who needs it, and how do you do it? In response to this request for information concerning computer literacy, the third Project BEST teleconference is entitled "Becoming Literate with the New Technology." It will originate in Owings Mills, Maryland, from the studios at the Maryland Instructional Television Division, Maryland State Department of Education on the grounds of the Maryland Center for Public Broadcasting (PBS Satellite Transponder 9, WESTSTAR).

Each of the previous BEST teleconferences has used a different format as part of the Project's experiment to use telecommunications to learn about the new information technologies. The May 18 teleconference is no exception. This teleconference will involve several discussion segments with school practitioners on the issue of becoming literate with the new technology, focusing primarily on the microcomputer. Training strategies for administrators, school staff, students, parents, and educators in general will form the nucleus of the teleconference.

As a prelude to the May 18 teleconference, a 30-minute prerecorded videocassette will be transmitted to the designated reception sites during the morning of May 17. This module will document the current experiences and concerns of practitioners at six school sites around the country. Project BEST state teams will be asked to view the video module beforehand and to prepare pertinent questions dealing with the issues presented in the module, which can be addressed during the May 18 teleconference. A "video newsletter" will also be transmitted with the video module on May 17. The newsletter, a ten-minute presentation, will highlight new products, materials, projects, and experiential information from the federal, state, and local levels.

The one-hour interactive teleconference on May 18 will be beamed via the PBS satellite service at 2:30p.m.(EST). The teleconference will explore ways that team members and invited participants can use the video module in their states to provide technical assistance and information to local school personnel. Selected short segments from the video module will be used to focus call-in questions from viewing sites to assist states in developing strategies for use of the module with local education agencies. Topics of discussion will include:

- Should computer literacy be a mandatory or elective activity?
- When does one become literate and what specific criteria should be used to assess literacy?
- Who should lead the computer literacy effort? Who should provide instruction/training?

The teleconference will also include a short segment containing significant learnings and constructive feedback concerning Project BEST teleconference presentations to date, as well as information on the way states are using other Project BEST products and services.

If you are interested in participating in the May 18 teleconference in your state, contact your Project BEST state team leader or call Henry Ingle at the Project BEST office in Washington at (202) 466-3361.

By background and training, you're strongly identified with higher education. How will you ensure that the other members of AECT, e.g., those involved in K-12, in telecommunications, in business and industry, are properly represented and serviced?

I think we should first dispell any feeling of exclusivity regarding my identity with higher education. Given my outspoken criticisms of higher education, I doubt that many higher educators would particularly identify themselves with me. I never planned a career in education. I was headed for the diplomatic corps, but a stop along the way to work for Senator Wayne Morse of my home state of

Continued on page 13

COMPUTER LITERACY PROFILE

ALBANY, OHIO

- Rural Appalachain district 8 miles from Athens, Ohio
- Chief employer is Ohio University
- Small, far-reaching school district with a K-12 enrollment of 1,680
- Started in 1980 with an Apple II+, currently have 17 microcomputers of various brands
- Teaching staff of 102

At the Alexander Local School District in Albany, Ohio, computer literacy has brought parents, teachers, and students closer together. The new superintendent, Dr. Raymond Yeagley, brought with him a working knowledge of computers and convinced residents of Albany that there was a place for computers in their small rural school district.

Dr. Yeagley trained the Executive Secretary and the Assistant Superintendent and set the process in motion. Teachers took classes at nearby Ohio University and soon began to train other teachers. The district responded to a heavy demand for training by the community by holding evening and weekend classes for as long as interest held up.

Teams of parents and children learn together about working microcomputers and this has added an extra dimension to the parent/child/teacher relationship in the district. Parents also volunteer their time during the school day to monitor students as they go through exercises designed to familiarize them with the computer and to sharpen their logic and reasoning skills. The school district is currently giving each student roughly ½ hour on the computers every week. This not only gives them experience on the machines, it also reduces overcrowding in the classrooms and gives parents an opportunity to work with the students.

Programming is taught at the high school level. Several different brands of micros are used so that students learn to be flexible in transferring their computer skills. There is still a heavy demand for training from the community, and currently the district is looking for ways to purchase more hardware in order to meet that demand.

COMPUTER LITERACY PROFILE

ANN ARBOR, MICHIGAN

- Suburban area near Detroit
- Chief employers are University of Michigan, Ann Arbor Public Schools, Parke-Davis Pharmaceuticals, Bechtel, small research firms and printing businesses
- K-12 enrollment of 14,500 students; 26 elementary, 5 intermediate, 2 traditional and 2 alternative high schools
- History of mainframe experience; started 7 years ago with mainframe terminals in the high school math department. Began pilot program using microcomputers 2 years ago; now using micros at the elementary level for computer literacy
- Over 300 microcomputers--mostly PETs, some Apples, some TRS-80s
- Teaching staff of roughly 700

In the Ann Arbor Public Schools, computer literacy begins with media specialists. The media specialist in each building is given responsibility for all school A-V equipment, including the microcomputers, often kept in the library or media center. At the onset of the computer literacy program in Ann Arbor, all the school media specialists in the district received microcomputer training. From there, a training model was established to encourage teachers and other faculty to attend classes offered by the district. Anyone interested--teachers, administrators, custodians, secretaries--may attend these classes. A school building receives a microcomputer from the central office for every three people who attend a training session.

Activities on the micros are integrated into all aspects of the curriculum and are often completed during visits to the library or media center. Teachers are encouraged to take computers home with them over holidays and summer vacations to become familiar with them. This is also a protective security measure for the school district. Elementary children are informally introduced to programming and how a computer works by using "Big Trak," a programmable toy tank. The main thrust at this level, however, is on computer awareness.

COMPUTER LITERACY PROFILE

PLAINS, MONTANA

- Small rural mountain community; population 1100; located 80 miles from Missoula, Montana
- Logging is primary industry; currently experiencing close to 30% unemployment
- Teaching staff of 36
- Small school district with a K-12 enrollment of 564; elementary and high schools share the same building
- Started 2 years ago with Radio Shack Model III microcomputers; currently own 13 machines

Computer literacy in Plains, Montana is a community effort. Two years ago the superintendent, Jim Foster, surveyed the residents of this small logging community and determined that computer literacy was a priority. After the school district bought 13 Radio Shack Model III microcomputers with Title IV funds in spring of 1981, high school teachers took the machines home over the summer to learn how to use them. The following fall, Radio Shack representatives from Spokane, Washington held a two-day intensive workshop for teachers who would be using the machines at Plains High School. Shortly thereafter, trained teachers spent afternoons, evenings and weekends introducing parents and still other interested teachers and administrators to the new microcomputers.

Computer literacy is defined as an awareness, familiarity, and comfort in working the microcomputer. Although one of the machines belongs to the library in the elementary school, the thrust of this computer literacy program is at the high school level. The program is concentrated in the math, science, and business departments. Students are introduced to computers through a programmable calculator and 9th graders are required to take algebra as well as typing before any computer science courses.

COMPUTER LITERACY PROFILE

CINCINNATI, OHIO

- Urban school district in southwestern Ohio
- Major employers include large corporations such as Proctor and Gamble, AT&T, and federated department stores
- District enrolls students K-12; total student population of about 51,000
- Total teaching staff of 2,678
- Began using a time-shared mainframe in the late 1960s to improve basic skills instruction and later moved into administrative applications; district is moving to micros for instructional applications
- All secondary schools and more than 50% of the elementary schools have at least one micro; a mix of brands is used including Atari, Apple, TRS-80, Texas Instruments, and Commodore PET

Cincinnati's emphasis in the use of computers has focused on computer managed instruction. Acquiring computer literacy, both for teachers and students, was not a priority in the past, but the situation is beginning to change.

Teachers have learned about computers through courses they have taken independently, school-organized teacher training programs, and courses sponsored by the district. Parents and community volunteers have helped schools that wanted to conduct their own teacher training programs. The district sponsors a Professional Growth Institute that offers credit and non-credit courses on a wide variety of subjects. In the fall of 1982, it was operating five computer-related courses ranging from a basic introduction to microcomputers to computer programming.

In the past, individual schools in Cincinnati developed and conducted their own computer literacy programs for students. District personnel now recognize the need for a district-wide computer literacy program. They are pilot testing available computer literacy programs in the hope that portions of existing courses can be combined, avoiding the need to prepare a new curriculum.

COMPUTER LITERACY PROFILE

FAIRFAX COUNTY, VIRGINIA

- Suburban county in the Washington D.C. metropolitan area
- Government and high-tech industries are chief employers; median family income $41,600 in 1981
- Tenth largest school district in the U.S.; enrolls 122,600 students, K-12
- Began using time-shared mainframe in late 1960s for data processing and computer science; now using micros for these subjects and computer literacy in K-12
- Estimated 584 micros, primarily Atari and NEC, in the 159 schools in Fairfax County
- Teaching staff of approximately 7,000

Fairfax County has developed a computer literacy program for teachers and students. The materials for both the teacher and student programs were developed by school district personnel.

Teachers are trained by fellow teachers who can explain how to integrate computer literacy into the on-going curriculum. Teacher training emphasizes how computers can be used in the classroom, rather than computer programming. The program stresses comfort with the keyboard, loading programs, and implications of computing for children, adults, and society. Attendance is voluntary at these after-school classes. Teachers' interest is high, as indicated by the operation of over 20 classes per semester during the 1982-83 school year.

The student computer literacy program focuses on: (1) how the computer works, (2) the impact of computers on the home, (3) the impact of computers on careers, and (4) hands-on experience. A formal computer literacy curriculum is being developed by the school district staff. The curriculum at each grade level is designed to coordinate with the regular course of study. It was written by district teachers based on their classroom experiences, field tested, revised, and then distributed during the 1982-83 school year. The computer literacy curriculum assumes that children will be learning about computers throughout their school careers. Consequently, the elementary school curriculum is quite basic; lessons become more complex at the intermediate level, and computer applications are taught at the high school level.

COMPUTER LITERACY PROFILE

CUPERTINO, CALIFORNIA

- Unified school district; serves six municipalities in California's Silicon Valley
- High-tech middle-income community with many aerospace and computer-related industries
- Approximately 13,000 students in a K-8 program
- Began introducing microcomputers for instruction in 1977
- A combination of Atari and Apple microcomputers are used; the district has approximately 170 micros in its 24 schools
- Total teaching staff of approximately 500

Cupertino Union School District has developed a computer literacy program for grades K-8 that focuses on computer awareness, computer interaction skills, and programming. A copy of their revised K-8 computer literacy curriculum was featured in the March 1983 issue of The Computing Teacher (Vol. 10, No. 7, pp. 7-10).

For grades K-6 computer literacy is infused in the regular math, language arts, social studies, and science curriculum. Children are taught LOGO and PILOT. At the junior high school level, introductory programming and applications are taught in a one-semester course that all students are encouraged to take.

Teachers are learning how to use computers in a variety of district-sponsored training activities. More than 20 mini-courses on computer basics, classroom applications, and programming are available through the inservice training program. Participation is voluntary, but teachers receive credit toward time off or the purchase of materials as an inducement to attend. Schoolwide training programs are developed for interested schools. These programs are adapted to the unique needs and conditions of the school. A laboratory training program was offered during the summer as part of a computer camp. In addition, teachers are encouraged to borrow equipment and practice at home. A support system known as the Lead Teacher Network has been set up to exchange experiential information among schools. One teacher from each school attends, shares information, and brings new ideas back to his or her school.

The district offers separate training programs for school administrators and parents. The computer literacy training program for principals focuses on management applications and administrative concerns. Training for parents is designed to prepare them for volunteer work in the school computer literacy program.

Selected Bibliography of Print and Non-Print Information Resources on Computer Literacy

Compiled by

Project BEST
Association for Educational Communications & Technology
1126 Sixteenth Street, NW - Room 214
Washington, DC 20036

May 18, 1983 Computer Literacy Teleconference

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PARTICIPANT FEEDBACK FORM

PROJECT BEST MAY 18, 1983
VIDEO TELECONFERENCE

Your comments have been helpful to Project BEST in enhancing our understanding of your information needs and in designing future materials to respond to those needs. We would appreciate it if you would take a few moments to comment on the teleconference and support activities. Please note that the feedback form lists the objectives of each element of the program. We ask that you evaluate the elements in terms of what we attempted to accomplish.

A. The Videotape: Learning and Teaching ABOUT Computers

The primary audience for the videotape is LEA staff. SEA personnel involved in state computer literacy programs are a secondary audience. After viewing the videotape, participants should:

- Know that there are many different definitions of computer literacy;
- Know how several different districts are helping adults and students become comfortable with the technology;
- Feel prepared to define computer literacy for themselves; and
- Be interested in acquiring computer literacy skills.

1. Please evaluate the videotape in relation to the objectives and target audience listed above. Rate the tape on the following characteristics using a scale of 1 to 7 with "1" to represent low and "7" to represent high.

	Low 1	2	3	4	5	6	High 7
a. Informative content	___	___	___	___	___	___	___
b. Useful method of presentation	___	___	___	___	___	___	___
c. Utility to LEAs and schools	___	___	___	___	___	___	___

2. What were the strengths of the videotape?

3. What suggestions would you offer for the design of the remaining videotaped segments about schools?

B. The Teleconference: Becoming Literate with the New Technology

The audience for the teleconference is the State Project BEST team and any other guests invited to attend. It is possible that LEA personnel may be interested in seeing a videotape of the teleconference, thus they constitute a secondary audience for the teleconference. The purposes of the teleconference are to explore:

- issues and concerns relating to the implementation of computer literacy programs in the schools;
- the potential role of the SEA in fostering computer literacy; and
- how the videotaped segment can be used in computer literacy training programs in the states.

1. Please rate the teleconference panel and question and answer session on the following characteristics. Consider the objectives and audience noted above and use the following rating scale: 1 to 7 with "1" representing low and "7" representing high.

		Low 1	2	3	4	5	6	High 7
a.	Informative content	___	___	___	___	___	___	___
b.	Useful method of presentation	___	___	___	___	___	___	___
c.	Relevance to your work	___	___	___	___	___	___	___
d.	Utility to LEAs and schools	___	___	___	___	___	___	___

2. What were the strengths of the teleconference?

3. How would you improve the format if panels and Q and A call-ins are used in future Project BEST video conferences?

C. Video Newsletter

The video newsletter is intended for SEA personnel. Its purpose is to update Project BEST state teams and other SEA personnel about

- current developments in the field, and
- news about Project BEST.

Please consider these objectives in rating the effectiveness of the newsletter.

1. Please rate the newsletter on the following characteristics again using a 1 to 7 scale with "1" representing low and "7" representing high.

	Low 1	2	3	4	5	6	High 7
a. Informative content	___	___	___	___	___	___	___
b. Useful method of presentation	___	___	___	___	___	___	___
c. Relevance to your work	___	___	___	___	___	___	___

2. What were the strengths of the video newsletter?

3. How would you improve the design of the video newsletter?

D. Print Support Materials

The materials are intended for viewers of the videotape, the newsletter, and the teleconference. Their objective is to provide background information that will assist viewers in understanding the video material.

1. Please rate the print materials on the following characteristics again using a 1 to 7 scale with "1" representing low and "7" representing high.

	Low 1	2	3	4	5	6	High 7
a. Clearly written	___	___	___	___	___	___	___
b. Well organized	___	___	___	___	___	___	___
c. Useful content	___	___	___	___	___	___	___

2. When were you given the print material?

   a. In advance of the teleconference ______

   b. At the teleconference ______

   c. After the teleconference ______

   d. Not given a copy ______

3. Did these materials help you understand the content and focus of the program?

   a. Yes ______

   b. No ______

OVERVIEW OF SITE ACTIVITIES REPORT

PROJECT BEST MAY 18, 1983
VIDEO TELECONFERENCE

State ______________________________

Respondent's Name _________________________________

1. Please attach a copy of your attendance sheet for the May 18, 1983 teleconference.

2. If you encountered any problems with the viewing site or the reception, please indicate them below.

3. Please briefly describe any pre- or post-teleconference activities you conducted in conjunction with the Project BEST broadcast.

4. Please summarize participants' comments on a copy of the evaluation form and return it to Project BEST by June 8, 1983.

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Learning and Teaching About Computers: A Video Module User's Guide (May 1983) 4

Teaching with Computers--What Can I Do: A Video Module User's Guide (July 1983) 6

Computerwares--Hard and Soft Decisions: A Video Module User's Guide (July 1983) 8

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Cupertino Union School District, Cupertino, California CU.1

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Plains, Montana P.1

Alexander Local School District, Albany, Ohio A.1

Cincinnati, Ohio CI.1

Fairfax County, Virginia F.1

School District Cooperative Profiles: Introduction IN.1

Ft. Madison, Iowa (September 1983) FM.1

Wayne, New Jersey (September 1983) W.1

TAB 4: DESCRIPTIONS: OTHER VIDEO AND PRINT MATERIALS--Description and suggestions for use.

Introduction to Teleconference Panel Discussions and Newsletters 0.1

Project BEST Video Newsletter #1, October 27, 1982, Teleconference 1.1

Guide Sheet: Information Products Presented on October 27, 1982, Project BEST Newsletter 2.1

State Education Agencies and the New Technologies: October 27, 1982, Teleconference 3.1

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School-Industry Cooperation and High Tech--The Feeling is Mutual, January 24, 1983 Teleconference 5.1

Issue Paper: Schools and the New Information Technology: Fostering Public-Private Sector Cooperation (January 1983) 6.1

Project BEST Video Newsletter #2, May 18, 1983, Teleconference 7.1

Guide Sheet: Informational Products Announced on May 18, 1983, Project BEST Newsletter 8.1

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Significant Learnings Paper #2: BEST NET: Electronic Mail as a Medium for Educational Information Exchange and Networking (August 1983) 13.0

TAB 6: APPENDIX: SELECTED ARTICLES ON PROJECT BEST

- INSTRUCTIONAL INNOVATOR (Reprints)

"AECT Assists U.S. Department of Education in National Conference"
September 1982

"Project BEST Spreads the Good News About Technology in Education"
September 1982

"October - Another Big Day for Project BEST - What's Involved"
by Henry Ingle and Cheryl Petty
October 1982

"January 24 - Red-Letter Day for Project BEST!"
November 1982

"Schools and the New Technology: The Getting Started Process"
January 1983

"Questions and Answers on the B.E.S.T. Approach to Electronic Mail"
Cheryl Petty
February 1983

" 'Becoming Literate with the New Technology' Project BEST Teleconference--May 18"
April 1983

" 'The Feeling is Mutual': School/Industry Cooperation"
by Carol Wolinsky and Henry Ingle
May 1983

- OTHER JOURNALS (Reprints)

"Project BEST: What is it?...Who's Involved?...And How Are States Benefitting?" by Henry T. Ingle. AEDS Monitor, March/April pages 31-33

"Linking the New Information Technologies to the Work of Statee Education Agencies: A Profile on Project BEST," by Henry T. Ingle. The Mahe (Maryland Association of Higher Education) Journal, Volume 6, Summer 1982, pages 7-16

"Learnings on Videoconferencing from Project BEST," by Lewis A. Rhodes. EITV, Volume 15, Number 7. August 1983, pages 24-25 and 63-64 and 66. (Copy Forthcoming, September, 1983).

"When Is a Talking Head Not a Talking Head?" by Lewis A. Rhodes. EITV, Volume 15, Number 9, October 1983. (Copy Forthcoming, September, 1983).

VIDEO TAPE MODULES

Four video tapes (video modules) and accompanying guides were designed for group and individual viewing. The following section contains guides that suggest ideas for helping viewers watch the tapes and discuss topics presented in them. These reproducible viewer guides provide suggestions for both pre- and post-viewing discussion. A copy of the guide should accompany each tape distributed. Packaging directions for both 3/4" and 1/2" tape formats are on the back panel of each guide.

Each tape contains information that should interest at least four audiences: school administrators, teachers, content/curriculum specialists, and parent/community groups. The modules document the experiences of a cross section of educators from six school districts across the United States. The modules do not suggest definitive "models" but present the current experiences and views of the educators on each topic. Topics addressed by the modules are:

- The Getting Started Process -- telecast January 1983
- Learning and Teaching *About* Computers -- telecast May 1983
- Teaching *With* Computers: What Can *I* Do? -- telecast June 1983
- Computerwares: Hard & Soft Decisions (Guidelines for Hardware and Software Selection) -- telecast June 1983

GENERAL DISCUSSION

- How are educators in your district gaining initial experience with the new microcomputer technology? View the module to learn how others are becoming familiar with microcomputer.
- Many educators are becoming interested in microcomputers. What personal benefits are they deriving from this technology? What job benefits? Discover what other educators say about benefits.
- What roles can various people play in furthering the introduction of microcomputers into schools? The module identifies roles played in other districts.
- What problems or obstacles are encountered in getting started with microcomputers? The module shows how these problems or obstacles might be addressed.

NOTE ON PACKAGING

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THE
GETTING STARTED
PROCESS

A

VIDEO MODULE USER'S
GUIDE

Project BEST
Association for Educational Communications
and Technology
1126 Sixteenth Street, N.W.
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INTRODUCTION

The video module this guide accompanies presents the experiences of teachers and administrators in five school districts. These districts were chosen because they reflected the size, geography, personnel experience, and economic diversity of school districts across the United States that have begun to use microcomputers in their schools. The districts are: Albany, Ohio; Cincinnati, Ohio,; Ann Arbor, Michigan, Plains, Montana, and Fairfax County, Virginia. The module documents personal experiences in becoming familiar with microcomputers, describes how and why the districts began using micros in their schools, and tells what they have learned as a result of these efforts.

The video module can be used in conjunction with training activities for administrators, teachers, content/curriculum specialists, and parent and community groups. The module makes no attempt to suggest models for getting started with microcomputers. Its purposes are to show some workable approaches and to suggest what to anticipate in the getting started process. This information may help viewers introduce microcomputers in their own districts or help trainers prepare others to begin using microcomputers. Rather than emphasizing a traditional case study approach, the module employs a problem-solving format that notes similarities and differences in the processes and experiences of the practitioners documented on the video tape.

The objectives of this module are to help viewers:

Know

- How school systems are getting started with the new technology, including commonalities and differences in approach
- Why these approaches are being used
- Common problems faced in getting started and the range of solutions tried
- Differences between the getting started process at the district and building levels and the support needs at each level.

Identify

- The implications for their own districts.

USING THIS MODULE WITH A VARIETY OF AUDIENCES

ADMINISTRATORS

Pre-Viewing

- How have you started to use the new microcomputer technology? Compare your experiences with those shown.
- What were some of the constraints you faced as you began to start using micros? Determine to what extent your constraints parallel those shown in the module.
- List major administrative problems/questions you have regarding the getting started process. View the module to identify possible solutions or answers.

Post-Viewing

- To what extent were your problems/questions resolved as a result of viewing the module? What other questions remain to be resolved and how might you resolve them?
- What administrative activities/approaches seemed particularly effective in facilitating the implementation process? Which of these might you use in your setting?
- What did you learn from the experience, of persons shown in the module?

TEACHERS

Pre-viewing

- List some of the obstacles you have faced in introducing microcomputers in the schools. Compare your problems with those shown in the module.
- How might you use the microcomputer as a personal tool for instruction or home use? Learn what others have done.
- List questions you have about initial organization, planning, and use of microcomputers. View the module for possible answers.

Post-Viewing

- Which of your questions were answered as a result of viewing the module? Explore strategies for seeking answers to remaining questions.
- To what extent are your experiences in getting started similar to those of persons shown in the module?
- What resources might you tap in introducing microcomputers into your classroom?

PARENTS/COMMUNITY GROUPS

Pre-Viewing

- Identify some of your fears in getting started with microcomputers. Compare your fears with others
- View the module to discover how you might help school personnel get started with microcomputers in schools

Post-Viewing

- How might you help schools plan to use microcomputers? List these ideas and share them with appropriate school officials.
- What strategies might you use to enlist support from industry to help your schools introduce computers into the curriculum?

CONTENT/CURRICULUM SPECIALISTS

Pre-Viewing

- Describe the approaches you have used in incorporating microcomputers in your content area.
- List the issues you have identified as being crucial to preparing teachers and administrators for introducing computers in their instructional settings. View the module and note how others have conducted staff development.
- List the problems you have experienced in getting started with microcomputers.

Post-Viewing

- What possible solutions to your problems did the module suggest?
- What additional topics and areas might you address as you develop a microcomputer inservice program in your content area?

GENERAL DISCUSSION

What does computer literacy mean to you? View the module to see what it means to others.

- How are schools in your district teaching computer literacy? Note how other school districts have approached computer literacy.
- What are the major problems and concerns you face as you address the area of computer literacy? See how others have addressed them.

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LEARNING
AND
TEACHING
ABOUT
COMPUTERS:

A
VIDEO MODULE USER'S
GUIDE

Project BEST
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INTRODUCTION

The video module this guide accompanies presents the computer literacy experiences of personnel from six school districts. These districts were chosen because they reflect the size, geography, personnel experience, and economic diversity of school districts across the United States that have adopted microcomputers in their schools. The districts presented are: Albany, Ohio; Ann Arbor, Michigan; Cincinnati, Ohio; Cupertino, California; Fairfax County, Virginia; and Plains, Montana.

The video module can be used with training activities for administrators, teachers, content/curriculum specialists, and parents and community groups. This guide highlights discussion topics that might be addressed with each audience. It includes questions to consider before and after viewing the video module.

The objectives of this module are to:

- depict the stages and ways in which adults and children in the schools are becoming comfortable with and adapting to the new information technologies
- familiarize the audience with the current array of practitioner issues, concerns, and controversies relating to starting computer literacy programs in schools
- help viewers understand why schools are currently organizing for computer literacy and how they are defining the term.

USING THIS MODULE WITH A VARIETY OF AUDIENCES

ADMINISTRATORS

Pre-Viewing

- List the major administrative computer literacy issues and questions in terms of management, instruction, and staff development that your school(s) are now facing. Identify possible solutions as you view the module.
- What are some of the constraints/variables related to starting computer literacy programs in your school(s)? Notice how others are overcoming their constraints and controlling their variables.
- How is your school system defining the concept of computer literacy? Determine the extent to which your understanding of the concept is similar to or different from those presented.

Post-Viewing

- To what extent were your issues and questions addressed in this module? What other issues do you need to explore? How might do this?
- What refinements to your current understanding of computer literacy might you now consider?
- What administrative support might you provide your staff as they develop computer literacy programs?
- What level of computer literacy do your staff members have? How can their familiarity with the technology be increased?

PARENTS/COMMUNITY GROUPS

Pre-Viewing

- How are the students in your school learning about computers? View the module to see how other students are learning about computers.
- In what areas might your support be helpful to your school's efforts to develop a computer literacy program?
- What does "computer literacy" mean to you? As you view the module, find out what it means to others.

Post-Viewing

- What activities would you like to engage in to improve your level of computer literacy?
- How might you support your school's computer literacy program?
- What does "computer liter[illegible]ar to you now that you have seen the module?

TEACHERS

Pre-Viewing

- How would you describe the ways in which you are learning about microcomputers? As you view the module, compare your experiences with those shown.
- How are your students learning about computers? Notice how other students are learning. Look for ways you might use these methods with your students.
- In the module others are attempting to describe the computer literacy concept. What ideas do you have about the concept? How might you define it?

Post-Viewing

- How could the use of computers enhance to what you are now doing in your classroom?
- What computer literacy activities might you wish to initiate for yourself and your students?
- How can you involve parents in your computer literacy program?

CONTENT/CURRICULUM SPECIALISTS

Pre-Viewing

- From the perspective of your curricular or content area responsibilities, how would you define the computer literacy concept? View the module and determine how others have defined it.
- What staff development issues have you identified in beginning a computer literacy program? Note the staff development issues addressed by others.

Post-Viewing

- What refinements or modifications to your concept of computer literacy (if any) would you now consider?
- What strategies might you use to help teachers view microcomputers as an instructional enhancement rather than an add-on?

GENERAL DISCUSSION

- How do you now use or plan to use microcomputers in your instructional program? As you view the module see how others are using them.
- What instructional problems are you now encountering that might be solved through the use of microcomputers? Note how other schools are using microcomputers to solve their problems.
- How can microcomputers be used to help students and teachers handle routine aspects of classroom instruction and building management?

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TEACHING WITH COMPUTERS: WHAT CAN I DO?

A VIDEO MODULE USER'S GUIDE

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INTRODUCTION

The 30 minute video module this guide accompanies presents the current experiences of personnel from six school districts. These persons have had direct, supportive, or administrative experience in teaching with computers. The districts were chosen because they are reflective of the size, geography, personnel, experience, and economic diversity of school districts across the United States which have begun to use microcomputers over the past two years. They include: Albany, Ohio; Ann Arbor, Michigan; Cincinnati, Ohio; Cupertino, California; Fairfax County, Virginia; and Plains, Montana.

The video module was designed to be used in training and awareness activities for schools and community groups that are interested in incorporating computers in school programs.

After viewing this module the viewer should:

- Know that microcomputers can be used to address a range of instructional problems regularly encountered by school personnel.
- Be aware of how teachers and administrators are using microcomputers to address those problems.
- Be aware of the type of activities needed to support using microcomputers in the classroom.
- Feel the challenge and excitement of teaching with microcomputers and attempting to use them them to solve teaching and learning problems.

USING THIS MODULE WITH A VARIETY OF AUDIENCES

ADMINISTRATORS

Pre-Viewing

- How is your school system using microcomputers to address various classroom and building problems? Compare your experiences with those shown in the module.
- How can you assist teachers and others to make effective use of microcomputers in various instructional settings? View the module to determine ways you might accomplish this.
- List administrative problems you are encountering as you help persons in your district incorporate microcomputers into school programs. Identify possible solutions to these problems.

Post-Viewing

- To what extent were you able to find possible solutions to your administrative problems? How might you implement some of these solutions?
- What types of administrative support do persons in your district need? What steps might you take to provide this support?
- What problems are building administrators encountering in scheduling, inventory, reporting, and correspondence? How might microcomputers help them solve these problems?

PARENTS/COMMUNITY GROUPS

Pre-Viewing

- How are teachers in your school using microcomputers in teaching? Contrast this with the ways in which the module depicts how others are using microcomputers to teach.
- How might the microcomputer be used to help students with homework or self teaching? What does the module suggest?
- List activities that a parent-volunteer program might initiate to help a school use microcomputers to supplement teaching. Note other areas in which school volunteers are providing help as you view the module.

Post-Viewing

- What can you do to assist school personnel incorporate microcomputers into the instructi[illegible] program?
- How might you motivate other pare[illegible]lunteers to help your school incorporate microcomputers into the curriculum?

TEACHERS

Pre-Viewing

- To what extent have you incorporated microcomputers into your teaching?
- How can microcomputers be used to support instruction instead of becoming a subject of instruction? Note examples of teachers using micros to support instruction depicted in the module.
- What perceptions of microcomputers are held by the faculty and staff in your building? Use the module to identify approaches that would allow them to broaden their perceptions.
- List the various ways and subjects in which you could use microcomputers in your classroom. Expand your list, after viewing, by adding ideas that came to you while watching the module.

Post-Viewing

- What new uses of micros have you discovered? Share these with your principal, resource teachers and others who may be instrumental in helping you implement those suggestions.
- Discuss with fellow teachers how microcomputers might help them in the areas of: paperwork, planning, student grouping, drill and practice, and interaction and discussion.
- How might parent volunteers help you incorporate microcomputers into your teaching? Share these ideas with appropriate parent/community leaders.

CONTENT/CURRICULUM SPECIALISTS

Pre-Viewing

- How might you encourage teachers to use microcomputers in their instructional programs? Identify approaches portrayed in the module that would help you accomplish this aim.
- List the concerns you and your school staff have as you move from teaching about to teaching with computers. See if your concerns are the same ones expressed by others.
- Many teachers view microcomputers as instructional add-ons rather than a support to instruction. Use the module to identify examples of micros as an instructional support tool.

Post-Viewing

- What do you see as your role in providing support to teachers as they begin to use micros for instruction?
- What staff development issues from your list remain unresolved? Develop a strategy for resolving these.

GENERAL DISCUSSION

- What criteria should one consider when selecting hardware and software? As you watch the module consider the criteria suggested.
- Which of your instructional priorities and objectives are now being supported through the use of microcomputers? Suggestions for supporting other instructional priorities are included in the module.

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COMPUTER WARES:
HARD & SOFT
DECISIONS

A
VIDEO MODULE USER'S
GUIDE

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INTRODUCTION

The 30-minute video module this guide accompanies presents the current experiences of personnel from six school districts. These persons have had direct, supportive or administrative experience in selecting and evaluating hardware and software. The districts were chosen because they are reflective of the size, geography, personnel experience, and economic diversity of school districts across the United States which have used microcomputers over the past two years. They included: Albany, Ohio; Ann Arbor, Michigan; Cincinnati, Ohio, Cupertino, California; Fairfax County, Virginia; and Plains, Montana.

The video module was designed to be used in training activities for the four audiences identified. These groups represent a cross section of persons who use microcomputers in school programs.

OBJECTIVES

After viewing this module the viewer should:

- Know some of the decisions involved in choosing hardware and software for school microcomputer programs.
- Determine who is making those decisions.
- Be able to make hardware and software selection decisions based upon an identification of the needs of learners and the intent of instruction.

USING THIS MODULE WITH A VARIETY OF AUDIENCES

ADMINISTRATORS

Pre-Viewing

- List some of the problems you have encountered in helping your staff select and evaluate hardware and software. Watch the module and note how other administrators have supported staff in this selection and evaluation process.
- What are some steps administrators should take to assist staff in determining how and when to develop their own software? Steps taken by other administrators are shown in the module. Determine the extent to which you need to take action in this area. What should that action be?
- Does your district have criteria for selecting and evaluating hardware and software? The module suggests factors to consider when conducting evaluations and making your selections.

Post-Viewing

- The module indicates several sources for finding software. Compile your own source list and share it with appropriate staff.
- Does your district have guidelines for hardware maintenance and repair? Consider using some of the guidelines suggested in the module.
- As the module indicates, many educators are creating their own software packages. To what extent is this happening in your district? What resources could facilitate this activity?

PARENTS/COMMUNITY GROUPS

Pre-Viewing

- What role might you play in assisting your school to select and evaluate hardware and software? In viewing the module you will discover how others have helped schools.
- What sources are the schools using now to locate software and hardware? Does the module suggest any ideas for locating additional resources within your community?

Post-Viewing

- The importance of equipment maintenance is illustrated in the module. What resources are available in your community to assist schools in this area?
- Some schools develop their o[illegible]uter programs. Are there members of your community who have this expertise?

TEACHERS

Pre-Viewing

- What criteria do you consider when selecting and evaluating hardware and software? Compare the criteria suggested in the module with your own.
- Who in your district has the responsibility for evaluating and selecting hardware and software?
- What help do you need to make your own decisions about hardware and software?
- What guidelines exist for maintaining and repairing equipment? View the module and compile a list of items that should be included in a comprehensive set of guidelines.

Post-Viewing

- To what extent do you feel comfortable in creating your own software? If developing this ability is important to you, what support do you need from school or district staff members?
- What steps might you now take to develop additional competencies in the area of software/hardware selection and evaluation? What resources are available to help you learn more about this field?
- How might you use parents, community members and members of the private sector to help your school with software development?

CONTENT/CURRICULUM SPECIALISTS

Pre-Viewing

- Many curriculum areas can be supported through the use of microcomputers. The module points out several applications. Determine if any of these uses are appropriate to your district or curriculum area.
- What role does computer gaming play in your district? Watch the module and note the role that games play in those districts.
- What is your role in hardware/software selection and evaluation? Are any roles suggested in the module appropriate?

Post-Viewing

- Should the criteria used for evaluating district or teacher created software differ from those used to evaluate commercial software? If so, how and why?
- What types of additional support might you provide schools in software development and evaluation?
- The module points out that hardware and software selection should be based on thoughtful planning, consideration of the needs of students, and the intent of instruct[illegible]hat types of staff development activities might you plan t[illegible] teachers make such decisions?

SCHOOL DISTRICT PROFILES

OVERVIEW

As part of its contract with the U.S. Department of Education program to help state and local education agencies discover how they might use new technologies to support basic skills instruction, Project BEST visited a number of school districts that had a minimum of two years of experience with microcomputers in the schools. The experiences of the personnel in the six school districts visited by Project BEST staff have been brought together in four videotapes that explore the initial issues schools address:

- Getting Started with Technology -- why educators are turning to technology and how they have become interested in it;
- Learning and Teaching About the Technology -- how staff and students learn to use and become confortable with the microcomputer as a tool;
- Hardware and Software Selection -- considerations in the selection process, procedures and evaluation criteria used; and
- Teaching with the Technology -- classroom applications of the technology in instruction and management.

Each of these topics is the subject of a 30-minute videotape that presents the experiences of personnel in the six school districts visited by Project BEST staff.

The districts visited were Albany, Ohio; Ann Arbor, Michigan; Cincinnati, Ohio; Cupertino, California; Fairfax County, Virginia; and Plains, Montana. These districts were not necessarily "lighthouse" districts. Rather, they reflected the wide variety of school districts in this country in terms of size, wealth, geographic location, urbanicity, and experience with computers. They offered examples of what could be done that might be useful to other districts in similar situations.

To supplement the videotapes, Project BEST has prepared a profile on each of the school districts presented in the videotapes. These profiles provide additional information about each district. They are not case studies in the traditional sense because they make no effort to tell the complete story of any of the districts. Instead, they provide a snapshot of the districts' status in the fall of 1982 regarding applications of computers, particularly microcomputers, to improve basic skills instruction, classroom management, and school administration. Computer science, programming, and centralized data management are not addressed. The profiles follow the sequence of the videotapes. Each contains the following sections:

- District Summary -- a capsule overview of the school district;

- History -- a discussion of why the district became interested in microcomputers, how they were initially introduced, and milestones in the early planning effort;
- Learning About Computers -- a description of how school staffs are being prepared to use microcomputers and how students are learning about these machines;
- Selection and Use of Hardware and Software -- an overview of what brands have been purchased and criteria used in their selection, procedures followed to evaluate software, and types of software used;
- Computer Applications -- a description of some of the ways computers are being used to support classroom instruction and management; and
- Spring 1983 Update -- a brief review of what has happened since the original site visit.

In addition, each report contains the name and address of an individual who may be contacted for further information and a listing of printed information about the district's microcomputer plans and programs.

SCHOOL DISTRICT COOPERATIVE PROFILES

INTRODUCTION

During the 1982-83 academic school year, Project BEST staff members visited eight school districts across the United States to examine their use of the new information technology, particularly microcomputers, in the K-12 levels. The technology experiences of school practitioners in six of these eight school districts were documented on videotape. The footage was edited into a series of four 30-minute video modules produced by Project BEST to share the technology experiences of these school districts with others. These six school districts are described in detailed case studies preceding this page. They include Ann Arbor, Michigan; Plains, Montana; Fairfax, Virginia; Cupertino, California; Albany, Ohio; and Cincinnati, Ohio.

The remaining two school sites that were visited, Ft. Madison, Iowa and Wayne, New Jersey, are illustrative examples of the way in which intermediate agencies are working with several different school districts in their vicinity to provide leadership and support for the technology efforts in those schools. For the purposes of Project BEST, these intermediate agencies were not videotaped and included in the video modules because they did not fit the pattern of technology use we were exploring--that is, the technology initiatives of individual school districts. Ft. Madison, Iowa and Wayne, New Jersey, however, are included here in the school profile section of the Project BEST Products *User's Guide* because both of these sites have many interesting and important learning points to offer in terms of inter- and intra-school district cooperation. The following pages contain a brief description of these two localities and the cooperative role intermediate agencies are playing with individual schools in the application of microcomputers.

CUPERTINO UNION SCHOOL DISTRICT
CUPERTINO, CALIFORNIA

DISTRICT SUMMARY

- Union school district serves six municipalities in California's Silicon Valley
- High-tech, middle-income community with many aerospace and computer-related industries
- Began introducing microcomputers for instruction in 1978
- A combination of Atari and Apple computers are used; the district has about 300 micros in its 23 schools
- Approximately 11,000 students in a K-8 program

History

Cupertino, California, is in the heart of the Silicon Valley, where many high-tech industries are located; it is the home of the Apple Computer Company. In 1977 the company showed the prototype of its Apple II microcomputer to Bobby Goodson, a math teacher in the Cupertino Union School District, and to William Zachmeier, the Associate Superintendent; they became intrigued with its potential. Several months later, when the district's initial Title IV-C proposal was rejected by the state, Bobby Goodson prepared a second proposal that involved the use of microcomputers for a junior high school math project. The proposal, which requested funds for a full-time director, was approved and provided funding for Bobby Goodson to spend two years learning and developing a program. Mrs. Goodson explains the early focus of her efforts:

> Our program began by putting a few students and a few computers together and watching to see what happened. It was my job to watch and then say where we could use microcomputers in the school.

From the beginning the emphasis of the program has been on use of the computer to facilitate students' creativity and learning. Programming skills have not been emphasized.

For the first two years Title IV-C funds were used to support Bobby Goodson's position as the Coordinator of Computer Programs. About 35 microcomputers were purchased in those years with Title IV-B funds, as well as money from state grants, funds for gifted students, and PTA donations. This time was used to learn about microcomputers by attending meetings and working with teachers and students. Inservice programs were offered to train interested teachers, thereby increasing the number of personnel available to work with computers.

By 1981, district personnel had sufficient experience and expertise to develop a plan for a computer literacy program. The Superintendent made a presentation to the School Board requesting funds for a computer lab in each of the four junior high schools and for a lab or computer cluster in 10 of the 20 elementary schools. Parents, students, and teachers supported the proposal and spoke on its behalf. The board accepted the recommendation and voted to approve the necessary funds.

Community support for a computer literacy program has been strong from the beginning:

> Parents were there to start the program in some of our schools. Many of our schools got their first computers through a PTA or Home-School Club, or other fund drive put on by the parents. In many schools the parents have come in and been the aides who have helped the teachers get started. (Bobby Goodson)

Cupertino's approach is to begin small, experiment, and then develop a plan for the future. A few teachers in the school learn how to use the equipment and gain experience with it. At that point the school is ready to submit a plan to the district requesting support for a cluster of seven microcomputers. Criteria the proposal must meet include evidence that every student will have access to the equipment, that the equipment will not become associated with any single group or subject area, and that logistics problems (such as housing, maintenance, and security) have been solved. In addition, the proposal must outline how staff will receive additional training, who will be responsible for managing the program and the equipment, and how software will be acquired and stored. If the plan is not fully developed, Mrs. Goodson or another resource teacher will work with school personnel to improve the plan.

Mr. Barnett, the principal of Stevens Creek School, explains the process his school went through:

> We sat down and decided some narrow things about computers: one, that all children would have access; and two, that we would not have shoot-em-ups on them. They would be instructionally oriented and our goal would be to interest children in computers and activities that support learning and thinking and also enrich the curriculum. Our goal was not to turn out programmers. So we bought one microcomputer, and then another, and pretty soon we bought more. Eventually we hired an interested parent as our computer aide to help in the school.

Learning About Computers

Teacher Training

Cupertino Union School District offers teachers a variety of avenues to learn about technology. Inservice training courses are offered through the district's staff development program. School-based staff development programs can be requested to meet the needs of specific schools. A third element is laboratory training during the summer, where teachers work by themselves and with students. Finally, the district encourages teachers to borrow school microcomputers and work with them at home to become comfortable with the equipment.

Marilyn Miller, the Coordinator of Staff Development, explains that the district is committed to a large inservice education program. Many district teachers have been in the system for a long time and are at the top of the salary scale. They have no financial incentive to take courses, but the district believes in continuing education as a way to improve skills and to inform teachers about changes. To encourage teachers to sign up for inservice programs, teachers are given incentives such as accruing hours toward a day of release time to attend a conference, or to accumulate money to purchase classroom materials not provided for in the regular budget.

Inservice classes are typically held after school hours. Occasional Saturday classes are scheduled for activities such as materials development that require longer blocks of time. Classes are taught by district teachers. In the beginning outside experts were used, but they were often too technical in their presentations.

Training is designed in small, non-threatening modules so that teachers can get acquainted with the technology in steps. For example, the first classes present background information and vocabulary. Classes are designed to pique teachers' curiosity and lead them into additional short courses. The district offers about 20 different computer-related classes in a flow that moves from computer awareness to software for classroom use and on to computer programming. Hands-on experience is an important element of the training.

A Lead Teacher Network has been established to provide additional support for teachers. Jenny Better, the Curriculum Coordinator, describes why it was organized and how it functions:

> Most districts give a big workshop and everybody feels very good about working with computers. But when you start working with the children, different problems come up, the anxiety level rises, and frustration sets in. We've found that's when we really need to get in and support the teachers. We need key people in each school to get together and say, 'Hey, this happened to me, too. It's okay. This is how I worked it out.'
>
> So we have organized the Lead Teacher Network. One teacher from the school represents its program. The group discusses what's happening, problems, strains, and new things they've done. It's almost like a therapy session.

This network provides a mechanism for sharing experiences across schools.

Administrator Training

Cupertino provides separate training programs for school principals. Bobby Goodson explains that principals' schedules and concerns about appearing uninformed in front of their teachers made them reluctant to attend classes designed for teachers. The district organized a summer workshop for principals in 1981 and has followed up with a sequence of morning workshops at regularly scheduled principals' meetings.

The initial focus of principals' training differs from teacher training.

> When I'm talking with teachers, I'm talking about how you're going to use the microcomputer in your classroom... The principals are often more concerned about the general idea. How do I administer it? What are the concerns about computers? What are my responsibilities? How is it going to fit into my program? They may not be as concerned about hands-on experience initially, but they find out very quickly that they want to know more. (Bobby Goodson)

Recent sessions with principals have begun to explore management and administrative uses of computers.

Computer Literacy for Students

Cupertino Union School District has developed a K-8 computer literacy program. The objectives and content were developed through experiences with children in classroom settings and in a summer computer camp. District personnel observed the children's work, watched what they could do, and then established objectives for the computer literacy program.

Jenny Better, the Curriculum Coordinator, explains the components of the program:

> We broke computer literacy down into computer awareness, computer interaction skills, and programming. We determined when each should be introduced, at what grades to reinforce the learning, and when to extend it to other areas.

The curriculum for K-6 differs from the junior high school program. During the first six grades, computer literacy is infused in the regular curriculum for math, language arts, social studies, and science. Children begin with LOGO in kindergarten and learn to use it to develop their thinking skills. In the upper elementary grades, children are introduced to Atari PILOT as a programming language. The junior high school course is titled "Computers." It is a one-semester elective in computer literacy for five hours a week that includes the introduction of programming in a structured format. All students are encouraged to enroll in the course during junior high.

Training Parents

Parental involvement is an important element of the Cupertino program. Parents are encouraged to work with children in the classroom or the laboratory. Parents are trained in a 10-hour sequence that begins with computer awareness, familiarizes the parents with what computers can do, and explains how they are used in the Cupertino curriculum. Parents can then work in the school and attend school-based training programs. Harvey Barnett encourages parent volunteers who have taken the introductory course to build their confidence by checking out a computer for the weekend and working with it at home.

Selection and Use of Hardware and Software

Cupertino's original bid specifications stated that the machine had to have 48K memory and be an Apple or equivalent. The district expected to purchase Apples but received a considerably lower bid from the Atari Corporation, also for a 48K micro. The ultimate decision was to purchase some of each brand. The district now has a mix of Apple II Plus and Atari 800 machines.

District personnel believe the mix is advantageous because each machine has something to offer. They like the graphics capability and PILOT program on the Atari microcomputer for creativity and prefer the Apple for the variety of software and other applications available. Teacher Sandy Bove maintains that it is important for children to use both machines. She says that people have a tendency to prefer the first brand they learn to use and believe it is the best. Working with two machines reduces the likelihood that children will adopt this attitude.

Jerry Prizant, the Director of Media Services, explains that the district is now planning to upgrade the equipment for the junior high school labs to 64K machines. Atari 1200 XLs and Apple IIe's will be purchased; the machines with less memory will be moved to the elementary schools. Each elementary school will receive one Apple IIe as part of its configuration of seven microcomputers.

Every elementary school has decided where to place the microcomputers. Some schools locate the machines in the classroom; others put them in the media center, library, or a computer laboratory. Bobby Goodson explains the rationale for this flexibility:

> Each school has a different set of circumstances--the architecture, the staff, the children, and the program are different in some ways. So from my position at the district level I cannot say "This is how it will best fit your needs..." And with each arrangement we have a chance to learn something else about what is possible with this equipment.

At the junior high schools, 16 microcomputers with disk drives are located in a computer lab. Fifteen machines are for the students and one is for the teachers. Students are paired two to a machine. The equipment is placed around the sides of the room; tables in the middle of the room can be used for class discussions.

Software selection has become a centralized function because it was difficult to control purchasing with the large number of packages coming into the market. A district Task Force comprised of the Computer

Coordinator, the Director of Media Services, the Curriculum Coordinator, and the junior high school Computer Lab Coordinator preview all courseware. Items they think may be useful are given to the Lead Teacher Network to test in the classroom. If the courseware is considered acceptable, it is listed in an inventory of courseware that may be purchased.

The district is developing its own computer literacy materials for the elementary school. A preliminary curriculum was designed, tested, and revised after classroom experience. A final activities guide that outlines objectives and how to achieve them should be available in the fall of 1983. Art Luehrmann and Herbert Peckman's text, Computer Literacy, is used in the junior high school program.

Computer Applications

Cupertino Union School District is using microcomputers to supplement classroom instruction, to support management, and for specialized purposes such as computer camp and working with handicapped children. Examples of these uses are:

Classroom Applications

- Programmable machines and robots, such as Big Trak and Topo, are used with kindergarten children to give them a concrete example of how LOGO and programming work. Children determine the path they want the machine to take and program it to perform accordingly. Harvey Barnett, principal at Stevens Creek Elementary School, says using the machines is an experience in logical thinking. It shows the children that "when they want to solve a problem--getting Topo where they want it to go--they can debug the program and with constant work get it to run the way they want. And then they feel really good."

- Oregon Trail and Lemonade are simulation programs used with groups of somewhat older children. History and economics classes use the simulations as a supplementary study of historical, political, and economic situations. Social interaction and peer learning are other benefits of these simulations.

- Programming is taught in junior high school through graphics, music, and animation. Richard Pugh, the coordinator of the junior high school program, asserts that "all the programming skills one would want to learn can be taught through these media. It's not a highly mathematical approach--that would turn a lot of kids off."

Management Applications

- At Stevens Creek Elementary School several management applications have been found for the microcomputer:

  - A list of all software in the school has been developed; it describes the program, the machine it will run on, and the grade level(s) it is appropriate for.

  - A list of all A-V equipment in the school and its location has been generated to keep track of the equipment.

  - A class list program is available that permits sorting many different ways and speeds generating new class lists for the next year.

  - A program for the library facilitates tracking of overdue books and notifies borrowers when books are overdue. The program has cut a one-to-two-day job down to a 1 1/2 hour job.

- Mr. Barnett at Stevens Creek uses "Personal File System" (PFS) to create a file of discipline reports. "Each time a child is sent to the office for a problem, my secretary or I enter the information and print out a letter to the parents. This way I keep good records and it works really well."

- Management programs that accompany instructional packages are used to track students' progress. These tools identify who has and who has not attained the educational objectives. Printouts can be used to group children with similar needs, to identify children who need remediation, and to inform parents about how they can help their children. These programs have generated parental support because they can see clearly what their children are learning and what their problems are, says Jenny Better. She asserts that these programs have also sold many teachers on using the computers.

- Teachers have found a program for an electronic grade book that is easy to use. It stores grades, permits rapid updating, and facilitates reporting to parents. Bobby Goodson says "it's really a delight."

Specialized Uses

- Parent volunteers are working with children who have Down's Syndrome. They use computer software to facilitate learning in subjects the children are having trouble with. "The computer is a great motivator for them," says Janet Van Zoeren, a parent volunteer.

- Down's Syndrome children have difficulty finding the correct keys on the keyboard. Ms. Van Zoeren developed cards that cover all rows but the one the children are working in to help them focus on the appropriate keys. When the children become more adept, she removes the card and assists them by telling them what row the correct key is in. "This provides another dimension because it helps the children with their language skills--what is top, bottom, left, right--that sort of thing."

- During the summer of 1982 Cupertino ran a computer camp to give teachers and children more exposure to computers than was possible in a classroom. Mornings were devoted to computer activities in logic and problem solving, and field trips and recreational activities were scheduled in the afternoons. Sandy Bove worked with the camp. She says, "We wanted to teach programming but we did not want to teach a programming language.... We tried to emphasize problem solving and creativity. We tried to relate computing to math, art, and music." Children were taught LOGO and PILOT.

Additional Information

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References

The following publications offer additional information about the district.

1. "Computer Literacy Curriculum: K-8." Cupertino Union School District. Revised 1982.

2. "Cupertino School District Develops Computer Literacy Curriculum." The Computing Teacher. March 1983.

3. Office of Technology Assessment. "Cupertino Union School District" in Informational Technology and Its Impact on American Education. U.S. Government Printing Office; Washington, D.C.: November 1982, pp. 200-203.

ANN ARBOR PUBLIC SCHOOLS

ANN ARBOR, MICHIGAN

DISTRICT SUMMARY

- Suburban area near Detroit
- Chief employers are University of Michigan, Ann Arbor Public Schools, Parke-Davis Pharmaceuticals, Bechtel, small research firms, and printing businesses.
- K-12 enrollment of 14,500 students, 16 elementary, five intermediate, two traditional and two alternative high schools
- Teaching staff of roughly 700
- Began using mainframe and terminals in the high school math departments years ago. Pilot program using microcomputers started two years ago: now using micros at the elementary level for computer literacy
- Over 300 microcomputers--mostly PETs, some Apples, some TRS-80s

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History

The Ann Arbor Public School System has an extensive district-wide computer literacy program. It began on a very small scale as a result of the efforts and interests of individuals in various schools. In four years the program has grown from one or two microcomputers in a few schools to more than 300 machines spread throughout the district.

In 1976, a math teacher at Community High School, Ed Hirstein, bought his own microcomputer. He held after-school sessions for students who were interested in helping him build microcomputers from kits and rented out the machines to raise money to build more. Several of the units were purchased by the district and placed in the high school math departments to complement the computer science courses that used mainframe time-sharing terminals. Some members of the teaching staff of the Ann Arbor Public Schools expressed an interest in what Ed Hirstein was doing. He set up several awareness and training sessions for his fellow teachers. It was through these informal sessions that many District staff people came to learn about the microcomputer.

Judy Schmidt is a librarian at Clague Intermediate School. She remembers how she was encouraged by a student to attend one of Ed Hirstein's training sessions.

> A library aide had talked to my secretary and said "What are you doing this afternoon?" and she said "I don't know," and he said "Why don't you come over to Community because Mr. Hirstein, who's the computer teacher there, is going to talk about the program we did this summer and it really should be interesting." So I still didn't know what I was going to do, and Mary, my secretary, told me that she was going over to Community. And I said "Well, I think I'll go along with you." So we went over and when we got there, there were, I think, nine or ten teachers all together in this small room, and eight of them were from Clague. All of them had been contacted by the same kid.

She was impressed by the motivation of this one student who rounded up all these teachers for a computer demonstration. It was a hands-on session and by the end of the class many teachers were hooked on microcomputers. One of them, Schmidt recalls, helped convince her that micros were a good learning tool.

> One of the teachers there was kind of notorious, especially at that time, for leaving faculty meetings early--if he made it at all--and for being a rather negative force in some ways. This particular person stayed 10-15 minutes after the session to finish a computer game; it was a question of motivation. Anything that motivates a person who's kind of turned off is something that I think teachers need to be excited about.

The Clague teachers who attended Ed Hirstein's session were set on getting a microcomputer for their school. At the time, the Commodore PETs were just coming out on the market. The teachers decided to squeeze money from the various school building budgets to buy one. Finding the money, as it turned out, was much easier than getting the district's permission to spend it. Schmidt says:

> They were sticky about it. They weren't sure in what direction the system was going. It was our own building money and we wanted to spend it the best way we knew how, but they were saying "Look, we don't know what direction things are going. Texas Instruments may be coming out with an inexpensive computer in a year or two. We're not sure we want you to get in there, and if you do spend your own money and we decide to get computers, you may get one less because you're one up on the rest of the schools." We decided to go ahead anyway and we bought our first PET.....
>
> They had good reason, I think, for wanting to slow us down a little bit, but my feeling is that when you have people who are ready, in a building, that's where you have a lot of energy and that's where you should, if you've got a small group that's ready, let them go ahead because then other people will catch that enthusiasm.

In 1978, two elementary school principals, Burt Lamkin and Glen Monroe, went to a computer conference in Minneapolis co-sponsored by the Minnesota chapter of the Association for Educational Data Systems (AEDS) and the Minnesota Educational Computing Consortium (MECC). The school district could not afford to pay their travel expenses so Lamkin and Monore, both of whom have pilots' licenses, flew themselves to Minnesota and took with them the media specialists from their schools, Anne Dake and Elaine Kerr. What they saw at the conference convinced them that microcomputers were an important part of a child's learning development--even for children in elementary school.

They returned to Ann Arbor with a conviction that microcomputers could be used at the elementary level. A parent volunteer who worked in the library at Burt Lamkin's school, Thurston Elementary, brought a machine in on loan to the school from her husband's computer firm. For the rest of the school year they concentrated on computer awareness for everyone in the building. The following year they bought a micro. Three more machines were purchased with the help of grant funds and PTO (parent/teacher organization) money. The parents in the community were eager to get a computer program started and weren't willing to wait until the central administration sanctioned a district-wide move toward microcomputers.

At Glen Monroe's school, Lawton Elementary, sixth grade teacher Gloria Stein was interested in what Monroe and media specialist Elaine Kerr had seen in Minnesota. Stein had been involved with time-sharing on a mainframe computer in 1974 and was impressed with the educational potential. Time-sharing for an elementary school, however, wasn't practical and she had to wait for the advent of the microcomputer. One of Stein's former students who had returned to the elementary school to visit told her, "You have to get one of these (microcomputers) for Lawton." Principal Glen Monroe was supportive of Stein's efforts. It was she who had originally sparked his interest in microcomputers and convinced him that the machines were instructional tools capable of motivating students far more than any other instructional aid.

Because of the strong interest demonstrated by Monroe and Lamkin, the District decided to pilot test microcomputers in their two elementary schools. They were each given a Commodore PET in 1978.

When the microcomputer came to Lawton, Gloria Stein was the only teacher who wasn't afraid to use it. She brought it into the classroom and discovered many applications for computer literacy, drill and practice, and enrichment. As more machines came into the school, other teachers' curiosity overcame their fears and with Stein's help they began using the micros in their classrooms. By this time, Stein had become proficient in software development and general trouble-shooting. She wrote programs for them to use and de-bugged existing programs. She realized that a user's guide was needed for teachers in the district. She suggested one be written.

> The teachers were truly intimidated by the machine. We gave inservice training but teachers did not want to learn how to use the computer with somebody looking over their shoulder. Dr. Billings, who is the head of the Instructional Media Center, came over one day and I said, "Somebody should write a very simple, rather humorous user's guide so that teachers could take it home with the PET. Nobody is bothering you; you're all alone. Nobody's watching you." and Dr. Billings said "When will you have it ready?" Well, it was ready by Christmas, and it did work. Teachers did take it home and had a very simple guide. They became pleased and at that point we literally had hijackings of computers in the hallways.

At Thurston, media specialist Anne Dake worked with students during their library period and with teachers after school. She also worked with Judy Schmidt at Clague Intermediate School designing library-related computer activities for students.

At the end of the two-year pilot period, the central administration decided to launch a district-wide computer literacy curriculum and provide inservice to elementary teachers. Microcomputers and software would be purchased and would become the responsibility of the media specialists in the K-8 buildings. At the secondary level, a precedent had been set that would be followed for microcomputers. The math department had responsibility for computers used in high school. As a result, the computer literacy program would be contained in the math curriculum and math teachers would be responsible for integrating micros into their lesson plans. One teacher in the math department was designated Computer Coordinator and given one free period per day to attend to computer-related activities.

Teaching About Computers

Teacher Training

The district designed a training model for elementary teachers that involved giving schools equipment in exchange for school personnel voluntarily attending inservice training. Dr. Rollie Billings, Director of the Instructional Materials Center (IMC), explains the training process.

> The design we use in our elementary schools is that any three individuals working in the building--it could be the principal, teachers, custodians, secretaries--any adult can go through a training module of approximately 12 hours. At the end of the module they take a competency test. If they pass the test, they get a point. And for every three points your building gets, you can have a microcomputer. That really solves the distribution problem. It really puts pressure where it should be.

> Teacher interest determines the amount of capability of using technology in your school. I think that the clue is that when you go to distribute funds across a relatively large district, there's never really enough money to make the distribution effective unless you put the pressure back at the building level. That's what the staff training model does. It says 'All you have to worry about is training your staff and we'll supply as much hardware as you need.' That's a very good motivation factor because there were only four or five schools that started out, and all of a sudden those schools had all the computers. Other schools then caught onto it. You don't have to worry about funding the total program at one time.

Training of the elementary teaching staff is the responsibility of Math Coordinator Marie Vitale. She and other teacher trainers hold inservice sessions after school from 4:30 to 7:30 p.m. or 7:30 to 10:30 p.m. They begin with hands-on training in how to load, run, and save a program. The program is poorly written deliberately so that teachers learn how to change a program to fit their needs in the classroom. To date, nearly 500 elementary teachers have been trained. Teachers already familiar with computers simply need to pass the test given by the district to earn a point for their building--they needn't go through the training module. Though the bulk of the training emphasizes computer literacy, programming is taught so that teachers can alter programs to meet their needs. A 2:1 ratio of teachers to computers is maintained and the trainers try to avoid associating computers with math. Marie Vitale explains why inservice has been restricted to the elementary school teachers.

> Computers were used at the secondary level for about the last 10 years. At the secondary level it started as computer mathematics for grades 7-12, and so computer programming is part of every mathematics course. Now it's beginning to branch out into other subject areas, using it for instructional purposes. Now in the elementary schools we are using the computers as an instructional tool.

Faculty members who go through the district training module or pass the competency test can become certified teacher trainers who can, in turn, hold inservice sessions of their own. Obtaining this designation provides an added incentive for teachers to complete the district inservice program.

At the elementary level, training for media specialists was mandatory. The district also trained teachers before giving them equipment. Whereas the junior high schools had been given three micros each and told to use them before training was completed, the elementary school staff was fully trained before any curriculum guidelines were set.

Computer Literacy for Students

Computer literacy was first introduced into the curriculum at the junior high schools and was taught as a separate course. At the high school level, computers were traditionally used only for computer science courses. Now microcomputers are being infused into some aspect of all high school math courses. Though students are exposed to programming not all students will become programmers. Micros are also used in the science program for simulations.

A committee was formed to examine curriculum issues at the elementary level, but Marie Vitale notes, "the biggest problem we have come up against is that the curriculum has not kept up with the training." The curriculum for grades K-6 is currently being revised and implemented. As a result, the seventh and eighth grade computer literacy unit had to be restructured as more and more students coming to junior high school had some experience with computers. The unit was recently updated to serve as a link between a progressive introductory program at the elementary level and an in-depth advanced curriculum involving programming at the high school level.

The elementary computer literacy curriculum starts in kindergarten and progresses through the sixth grade focusing on basic familiarity and comfort with the machine. Teachers achieve this objective in different ways. At Thurston Elementary School, Anne Dake holds many a computer awareness class in her library.

> With the first graders, my main objective is to make them comfortable with loading programs into the computer. We spend time learning where computers are used in our world. Many of their parents are involved in the computer profession so there's a lot of interest in the community. We also read stories about computers and talk a little bit about how they work.
>
> With fifth graders the unit is a little bit more detailed. We talk about the history of computers, how computers work. I open one of the computers to show them the inside--they're amazed, as much amazed as I was, I think. They also learn how to load programs and we talk about how to write some programs for the computer. We'll build a rocket and fly it across the screen or something like that.

Dake uses programmable toys and games with her students to introduce them to the concept of programming. She gives them exercises to do on the Speak 'N Spell and Speak 'N Math machines, or has them work with Big Trak, a programmable toy tank.

Administrators and Support Staff

Ann Arbor Public Schools have used a mainframe computer to support administration since 1973. Although it was designed to serve all the needs of both administrators and their secretaries, the computer was "down" often enough that staff avoided using it. District administrators found it difficult to justify the purchase of microcomputers when they already had a computer that was capable of doing the job. Deputy Superintendent Wiley Brownlee explains the reasoning behind the move to micros:

> The mainframe, we found out, even though it had a word processing program--and it was good--it was down so much. A secretary would say "Okay, I want to put on the attendance records or I want to put on some data for a report, and I've got this letter to do and I'm going to do that at 10:30," and she goes over at 10:30 and the darn thing's down.

Convincing support staff to use micros was not an easy task. Several administrators were either computer buffs or had learned about micros on their own. Some were able to coax secretaries into using the machines, but a system-wide mandatory switchover would have brought massive resistance. Brownlee describes his approach:

> There was resistance from the secretarial staff. There was a fear there, of "Is this going to replace our jobs?" or "If this is a skill you want me to learn, then you train me." Well, to change the whole system is great to play with on paper, but it's very hard to pull off. It's the incremental change you have more success with--little steps.
>
> What I did was learn a couple of programs myself--we have an Apple II--learned word processing and learned Visicalc. I went around to secretaries and clerical staff that were generating these reports by hand. It always was a lot of labor. I took that as an opportunity to say "I can show you how to generate that report." Not "I'm going to teach you how to use the microcomputer" but "I can show you how to generate that report in an hour or so and it will come every month and all you've got to do is add in the changes." I did that with two or three people and that was it. After that they were asking "Why can't you get us a course?"

Most of the administrative records and reports are now maintained or generated by microcomputer.

Selection of Hardware and Software

Like many large school districts, Ann Arbor has an approved list of hardware for its schools. When purchasing equipment, personnel are restricted to the approved brands. This requirement also applies to purchases by PTOs. If a school PTO wishes to use its funds to purchase, for example, a printer, terminal or disk drive, it must go through district channels to do so. This approach is advantageous to both the district and the PTO. The district has control over the kind of hardware its schools are using, and the PTO gets the equipment at a discount. Dr. Billings explains the hardware selection process.

> In the hardware field one of the unique things is the tremendous amount of new types of hardware. Every week there's something new. What you really have to decide, if you're going into it, is to make sure you buy enough equipment so that you have a standard. Otherwise, what you do is buy pieces of equipment, and if you don't do it rapidly enough, you have everything out of phase. You have a Phase I computer and a Phase II and they don't always interact. We looked at an inexpensive piece of equipment where we could multiply fast across the district, introduce the concept, and have all the various pieces of equipment be compatible.

This approach ensures consistency in the various school buildings, so that as students progress through the system, they are familiar with the equipment and have to learn only new skills and concepts. Billings notes that the consistent equipment also helps students who change schools in the middle of the school year.

Approved equipment for the district includes Commodore PETs in the elementary school buildings, PETs and Apples in the junior high schools, and PETs and Apples, and TRS-80s in the high schools. In the elementary school, micros are put on carts so that they may be rolled in and out of classrooms and the library.

Most elementary schools use cassettes rather than disk drives because of cost. Anne Dake explains why and how the cassettes are used.

> We use cassettes exclusively here at school. I have a disk at home, and they're certainly much faster, but the disks are also very tender. We have found first of all that the machine itself is very expensive and that's the reason we don't have one. The cassettes are virtually indestructible. We have had no damage whatsoever and have been working with them for four years now. The children recognize what the cassette looks like and are more comfortable with it.
>
> We have done one thing with the cassette that really speeds up the loading time--record one program on each tape. It is either recorded twice on one side or on both sides of the tape so that the kids can just load in whatever is first. They don't have to look through several things to get to the program they're looking for.
>
> The upper grade levels use both cassettes and disk drives and have labs as well as portable units.

Maintenance of the hardware is handled in-house, saving the district money and ensuring that Ann Arbor teachers are never without a microcomputer. There is a complete maintenance department in the Instructional Materials Center with a serviceman on call. If a teacher has a problem with a machine, the serviceman takes a new micro to the teacher in case he can't repair the problem on the spot.

During the summer and over holidays, the district encourages teachers to take the machines home with them. This gives the staff an opportunity to become familiar with the microcomputer in their homes at their leisure. It is also a security measure for the district. With several hundred microcomputers spread out in homes across town, the risk of theft or vandalism is much lower.

Software is stored centrally through the IMC. The district buys hundreds of programs to be pilot tested in the classrooms. A full-time media specialist at the IMC is responsible for purchasing software and getting it pilot tested in at least three classrooms. Both teachers and students write reviews on the programs, and teachers are asked to recommend software. The district then purchases those programs that meet its needs and includes them in its catalog of software that goes to all staff. Teachers are encouraged to purchase from the district programs they need for their buildings.

Teams of people write software for the district. They also alter programs for teachers. Some software, for example, is too violent for younger children, teachers feel. These programs can be changed to fit a teacher's needs better. Many teachers write or alter their own programs. Anne Dake and Judy Schmidt, for instance, both have microcomputers at home and spent the last summer vacation sending floppy disks to each other in the mail to work on new programs.

Computer Applications

At Thurston Elementary, students in the fifth and sixth grades can become "computer tutors" for younger children. These tutors are selected by their classroom teachers and work directly with the teachers of younger students. Anne Dake explains the duties and responsibilities of a computer tutor.

> They work with a first grade or kindergarten class and they work directly with the classroom teacher. They come to get the computers here in the computer center. All our computers are on rolling carts. They get the program that the teacher has recommended and take the equipment to the classroom, plug it in, load the programs, and work directly with the younger kids. It relieves the teacher of having to repeatedly walk over and get the programs started again. Plus, it's a very special boost for the older students because they're really showing off their skills.

At Lawton Elementary, Gloria Stein had tried to find a place where the computer wouldn't fit into the curriculum. She felt sure that it would not be effective in kindergarten. In working with four kindergarten students, however, she discovered still more applications. One of the children was learning disabled and responded very well to the machine. Another child spoke no English and the microcomputer not only provided him with a vehicle through which to learn the language, but also provided him with a reason to communicate with his classmates. Stein was convinced, but the teachers pointed out that there was no software to support using the micros in these programs. Stein got together with the special education teacher and the music teacher and began writing programs. They now have a well-developed program using the micro for students with learning disabilities and with the many students who come to Lawton without knowing English.

Stein particularly likes using the microcomputer for drill and practice. "You do not degrade the computer by using it for drill and practice," she says. It frees up that time a teacher would otherwise spend reinforcing skills that a computer can attend to patiently and effectively. Students, Stein explains, sometimes worry more about being reprimanded by the microcomputer than by the teacher.

> There have been many cases where the children would feel that what they have to learn is a drag. Spelling is a drag. Grammar certainly has to be one of the biggest drags for children in elementary school. Yet if they work with the computer it isn't. They truly do not want that computer to tell them they are incorrect. By the sixth grade, they truly do not care if the teacher tells them they are incorrect. Now, not to use that motivating force, I think, is ridiculous.

Stein uses LOGO with her classes; some fifth and sixth graders are already programming. The computers are phased into nearly every subject area, and students are often assigned homework using the computers because many children have them at home. Those who don't have access at home use the machines at school during library or class time.

Judy Schmidt at Clague Intermediate School designs exercises for students to work in the library. They are called option sheets and combine different resources in the library to make up a multi-media exercise using print, visual, and audio materials in conjunction with a microcomputer.

We have a variety of activities that are connected with something that teachers are teaching in class. We use dictionaries, the thesaurus, the Reader's Guide, and a host of reference books, regular books, and magazines. Just as with everything else, we work the computer into it. For instance, we had one lesson on war and American history. We had the kids take an almanac that shows the casualty figures and they go to the computer room and load a program called BAR, which creates bar graphs, and they feed those figures into the computer, run the program, and they can see how the casualities in Viet Nam compare with casualties in the American Revolution.

At the high school level, microcomputers are used primarily in labs in conjunction with work associated with the science and math departments. Don Newsted, a math teacher and the Computer Coordinator at Huron High School, explains the differences between the mainframe previously used in the high school and the microcomputer.

> The mainframe computer was an excellent tool to teach mathematics, but it had its limitations because if you were going to use it in the classroom you had to have telephone lines in the classroom. We installed telephone lines in six classrooms but there was no color and the terminals that typed out the answers were very slow. But the microcomputer added a new dimension--the flexibility that you can move it anywhere in the building. You can plug it into any circuit and you can have color on the screen to illustrate some of the concepts.

As Computer Coordinator, Newsted purchases all the hardware and software for his building, does some of the teacher training, keeps track of the software, and has other computer-related duties. He began this assignment four years ago on a volunteer basis. He has now been given one free class period a day to attend to these responsibilities. Now that teachers in other departments are starting to become interested in using microcomputers, Newsted is swamped with work.

The Science Department uses simulation programs with its students, but has relatively few computers. Because of the high ratio of students to computers in both the math and science departments, many activities with the micro are limited to after-class exercises using drill and practice. The tutorial nature of the software does not lend itself to whole-class instruction with a microcomputer.

Additional Information

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PLAINS PUBLIC SCHOOLS

PLAINS, MONTANA

DISTRICT SUMMARY

- Small rural mountain community; population 1100; located 80 miles from Missoula, Montana
- Logging is primary industry; currently experiencing nearly 30% unemployment
- Teaching staff of 36
- Small school district with a K-12 enrollment of 564; elementary and high schools share one building
- Started in computers two years ago with Radio Shack Model III microcomputers; currently owns 13 machines

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History

In the summer of 1981, Bob Briggs, a high school science teacher in Plains, Montana, attended a class given by the National Science Foundation through the Office of Public Instruction. It was offered to math and science teachers who were using computers in the classroom. Though he had no prior experience in computing, he spent three weeks learning to work a microcomputer. He was not pleased, however, with what he saw happening in the class. Mr. Briggs recalls:

> I was watching everybody else, and it didn't take long to see that something was wrong. They weren't accomplishing anything. I was seeing a lot of people playing on computers, but they weren't being used very well.

He decided that he would have to learn some practical applications on his own. Al Chery, the principal of the high school where Bob Briggs teaches, roomed with him that summer while taking other courses at the university. For the remainder of the three-week course, the two stayed up late every night working on a microcomputer that Briggs had borrowed from a student in Plains. Briggs notes:

> By the time the course finished, they had taught us a considerable amount. We were beginning to get some ideas and had some plans, and we decided that we needed to get computers in our school. We were cheating the kids. They weren't going to be as prepared as they could be. They were going to meet computers as soon as they graduated, and they weren't going to know what they were.

When they returned to Plains, Briggs and Chery looked for a way to bring some hardware into the district. With nearly 30 percent unemployment in Plains, they did not feel they could request an increase in the school budget. After meeting with the school board and other interested community members, however, they realized that computer literacy was a definite priority in Plains. With the consent and encouragement of Superintendent Jim Foster, the two launched a school-wide effort to submit a proposal for Title IV funds in September 1981--the last year for competitive grants in educational development.

The Plains school staff had never before written a grant proposal. Sensing the importance of a successful effort, Superintendent Foster sent Bob Briggs and Al Chery to the grants office at the state capitol to find out how to write a Title IV proposal. It became a school project involving teachers and secretaries from all departments. Briggs remembers, "Everyone went over it with a fine-toothed comb until we thought it was perfect." The grants office said that it was one of the best proposals they had ever read and awarded Plains $13,000 for the purchase of microcomputers.

Teaching About Computers

Teacher Training

"All of us," Briggs recalls, "started out from ground zero. We had some ideas about what we wanted to do with computers, but we really didn't know anything about computers at all." By the time the equipment arrived in April 1981, it was too late to do anything with the students so the school focused on teachers who would be using the microcomputers in the fall. That spring and summer, the teachers took the machines home and started working with them.

The district got in touch with Radio Shack in Spokane, Washington, and requested a formal course for school personnel. The company responded and brought 15 computers for a two-day intensive workshop for anyone who was interested. Thereafter, Briggs conducted inservice sessions for teachers as well as adult education classes for teachers and community members.

Although he was unsure about his ability to teach an adult education class, the residents insisted. Briggs recalls:

> I didn't know if I was ready or not, but I said 'Okay, we'll try one.' It wasn't that bad at all; matter of fact, it was pretty simple.

It was a great success. As soon as one session ended, people lined up to register for the next one; and the demand was still heavy at the end of the school year. Evening classes are currently held several times a month for parents and teachers. Teachers from Plains High School take turns teaching these community education classes.

Computer Literacy for Students

Computer literacy is limited to the math, science, and business departments at Plains High School. Briggs explains the early development of the student program:

> We wanted to use the computer as an instructional tool of some sort. We had decided that it could be used for enrichment and remediation, and it could be used for various approaches to teaching. That was what we put into our grant.... We could have gone on a whole-school basis, but we didn't have money or equipment for that. So we decided we'd concentrate on math, science, and business, and we decided to make the approach different in each field.

The math approach was to put some machines in the back of the classroom to be used for enrichment and remediation. The class would be taught normally, but if students finished class assignments, they could use the microcomputers for enrichment. Students having problems with the material could use the microcomputers for remediation. In the business department, the microcomputers were integrated into the curriculum. Word processing and accounting programs were part of the class requirements because students would encounter computerized office systems in the business world. The science department was faced with the dilemma of how to teach many students with only a few microcomputers. The district patterned the science classes after a monitor system they had seen at a university. They devised a model whereby two monitors were suspended, one on either side of the classroom, and one microcomputer was placed at the front of the room so that all students could participate and see what appeared on the screen. This arrangement permitted whole-class instruction with only one microcomputer.

Programming is taught also. Students must complete courses in typing and algebra before they may enroll in a programming course. Teachers are encouraged by what they see happening to students learning programming skills. Briggs notes, "We don't expect our kids to become programmers, but we want them to learn to control the machine. We want them to feel comfortable with the machine, to be able to use it." In teaching formal classes, teachers discovered that students who learned programming on their own learned more quickly and progressed more rapidly than students in a structured class. Students in the structured classes, they found, tended to limit themselves to the framework of the lesson plan. This affected the way the courses were taught. "Now," Briggs says, "we teach the words of the language. We teach what they can do rather than how to use it; and as a consequence, the kids use the commands in all kinds of unique ways."

Selection and Use of Hardware and Software

"When we first decided to select equipment," Briggs recalls, "we wanted something as similar as we could afford to the machine that [the students] were going to find out in the business world." At the time, no color or graphics capabilities were necessary. Students also needed a machine that could support a variety of software. The district finally settled on the Radio Shack Model III microcomputer. It seemed to meet all the requirements at the time of purchase--price, business approach, software support, and ease of maintenance. Briggs is quick to point out, however, that "if we had to do that again, now, no telling what we would come up with. A lot of those things have changed."

Software has always been a problem for the school district. Commercial programs, they discovered, just weren't adequate. Personnel attended computer conferences and subscribed to numerous magazines, searching for quality courseware. Ultimately, they turned to their own students for help. The first area they concentrated on was administrative programs. A microcomputer had been purchased for the District Clerk's office for payroll, inventory, and other kinds of record maintenance. Because commercial programs did not fit the district's needs well, they enlisted the help of several students. District Clerk Jo Hanson recalls:

> The students worked at the school that summer. They were able to use equipment and facilities. In exchange they sold us the programs at a discount. The programs are the property of the students. They have made them available to other schools in the state at a fee. The money all goes to the students.

The students then went on to build classroom programs. Any teacher using microcomputers can request a program to complement the lesson plan. Students work closely with the teacher to design a tailor-made computer program that suits the teacher's needs. Frequently the student/teacher roles are reversed and the student becomes the teacher. This has brought teachers and students closer and given teachers a new appreciation for the talents of their pupils. Elementary school librarian John Meckler notes, "It made me more aware of what a high school student can do and it got us on an equal level. I like that idea. I think I can learn from them just as much as they can learn from me."

The school now has a computer software committee dedicated to producing programs for all Plains teachers. Computer Coordinator Briggs, who oversees the software development process, says:

> The committee is formed on a need basis for the people who want the software. If somebody wants a program that's going to do something in particular that they can't find anywhere else, they come to me and say, 'I need some software.' That teacher automatically becomes part of the committee. He or she will have the final say as to whether that program does what he or she wants. I then look at the program and see if we can build something...and if I think we can, then I find some students or other teachers or whoever we think we're going to need as resources.

The students do most of the writing themselves, with guidelines from the teacher who will be using the program. Most of the software in the district is generated this way, although some commercial programs have been ordered through the many journals to which the district subscribes.

Computer Applications

Although the elementary school librarian uses a microcomputer to maintain the card catalog, most of the interest in Plain's computer program remains in the high school. Because the high school and elementary school share the same building, interest is likely to spread. It may be some time, however, before the curiosity reaches the intermediate school a few hundred yards away.

Classroom use of microcomputers varies from department to department. In math, micros are used primarily for enrichment and remediation and supplement the basic lesson plan. In the ninth grade, math students are introduced to microcomputers through a programmable calculator. Math teacher Barbara Morris uses the microcomputer to complement her Algebra II class. In the business department, the machines are used for word processing and accounting, and are integrated into the curriculum. The science classes use a dual monitor system and one microcomputer for whole-class instruction. Briggs explains his reason for using this method:

> I'm a science teacher and I like to teach using a lot of discussion, a lot of interplay among students. When you put a student on a computer, he answers the computer and he may be serious or may not be serious. What he gets out of the machine is not much more than what he puts into it. But if you have a knowledgeable class, and you have a lot of discussion and input, and you discuss all the options before you do them on a class basis, you can get a lot of input from the students. You can look at a graph and you can watch it being built across the screen, and you can discuss it as it develops. A student isn't going to discuss that with himself.

Designing the circuitry for the monitor system was a bigger job than anticipated. Briggs had seen such a monitor system used at a university and decided it was a cheap and effective way to use microcomputers in the classroom. He recalls:

> We ran into some problems very quickly because the computer that we had decided to use wouldn't do it. We called the people who manufactured the computer and asked them about it and they could not help. They would not help. We were kind of stymied. We didn't know what to do. I wasn't ready to give up. I had enough of a background in electronics to know that one of these machines could be hooked up to more than one television set. I finally got upset and went down to Mr. Foster, the Superintendent, and said 'I want to make a long distance phone call and I want to go to the top man.' As I remember, he made the first phone call,

> got somebody, and said, 'Listen, we're doing some things and we want some cooperation, and none of your people are giving it to us.' This was a big guy we finally got hold of, one of the vice-presidents, and he apologized all over himself and said that he would check on it and see to it that we got some help. Within two hours the phone started ringing and it didn't quit for two days. They couldn't do enough to help us once it came from the top rather than the bottom.

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Additional experience has reaffirmed some of the concepts underlying the Plains computer program. The district's typing and algebra prerequisites to the high school computer program were instituted to limit demand on a small number of micros, but the policy has proven beneficial in other ways also. Student attitudes toward math and business offerings seem to be improving and math scores on achievement tests have increased. Although it is too soon to claim that these trends are caused by the microcomputer, there appears to be a relationship. The computer program was integrated into existing disciplines in Plains; district personnel believe this approach facilititated the growth of students, teachers, and the curriculum.

Plains received a V/C 20 microcomputer for placing first in a computer conference. The machine operates through a hook-up with a standard television set. The district has elected to use this machine as a loaner to students who may take it home and use it with their families. This approach has brought more of the adults in the community in contact with the schools and with computers. The district is now considering starting a loan program for software as well.

The computer program is expanding in the district. The library program has grown and was featured in a national professional publication. The district has been named as a pilot school for a two-year study of computers in guidance counseling and career education. Special education students will receive instruction on Commodore 64 computers. There are plans to launch a computer assisted instructional program for grades one through five in the 1983-84 school year. New equipment is being purchased, primarily Texas Instruments 99-4A computers.

Because the program is constantly evolving and the industry is changing rapidly, Plains has decided to establish a permanent review committee for the computer program. The committee is currently considering these questions:

1. What innovations are likely in hardware and software?

2. What impact will introducing microcomputers in the elementary grades have on high school requirements and knowledge?

3. Are the program's goals and principles current and educationally valid?

Additional Information

For additional information about microcomputers in the Plains Public Schools, contact:

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ALEXANDER LOCAL SCHOOL DISTRICT

ALBANY, OHIO

DISTRICT SUMMARY

- Rural Appalachian district eight miles from Athens, Ohio
- Chief employer is Ohio University
- Teaching staff of 102
- Started in 1980 with an Apple II Plus, currently has 17 microcomputers of various brands
- Small, far-reaching school district with a K-12 enrollment of 1,680

History

The Alexander Local School District in Albany, Ohio, is nestled in rural Appalachia. It is a consolidated school district serving small, low-income communities.

Three years ago, Ms. Susan Holzaepfel wrote a Title IV-C grant to bring computer awareness into the district. She was a teacher of gifted and talented children and was interested in computer-assisted instruction as well as computer literacy. The grant was funded for the 1980-81 school year and the Albany Elementary School received an Apple II+ microcomputer.

Parents and teachers greeted this new addition with caution. Microcomputers were associated with video games and arcades. Some parents objected to the fact that only gifted and talented students would be exposed to the microcomputer; others considered it a waste of money. In general, it seemed like a bad idea and served only to further strain the relationship between the school district and the community. A rift had occurred in 1979 when teachers went on strike.

Despite these negative feelings, the district was convinced that microcomputers were an important part of the curriculum. Gradually, the community was also able to view the use of micros as a positive experience. The arrival of a new superintendent and the help of a regional education service agency served as important catalysts to sway the community and to ease staff anxiety about technology. Superintendent Yeagley had a background in computing and an interest in the new microcomputers on the market. Occasionally, he brought the school's microcomputer into his office, sharing ideas with staff on ways to use it. Dr. Robert Weinfurtner was the Executive Director of Southeastern Ohio Vocational Education Cooperative (SEOVEC), a regional education service agency. He was using a regionally-sponsored minicomputer for local school administrative services and reports. SEOVEC offered inservice training for administrators in the district. Administrators became more comfortable with the idea of microcomputers and passed the notion on to the staff. When Ohio University in nearby Athens, Ohio, offered a free training program in computer literacy, Dr. June Slobodian, the Assistant Superintendent, was designated to attend the session. Slowly, the staff at the Alexander Local School District was beginning to understand the microcomputer and what it could do for students.

In 1980, members of the staff and the community formed a Community Education Committee. This committee developed a proposal for a Basic Skills grant. These funds allowed teachers, administrators, and parents to work together to improve basic language skills and to "improve consumer economic concepts through application of principles of the marketplace." Once a week in the evening, parents and their children met together to learn how to be knowledgeable, discriminating consumers. The district learned that by bringing together groups of parents and children, they could establish "a bridge to bond together their educational and personal goals as they worked cooperatively to gather the skills and knowledge necessary to be literate in the present and future society." 1/

It wasn't long before the microcomputer became a part of the Community Education Program. The students who had been exposed to the machine in the gifted and talented program had responded well and were very motivated by the computer. Now that teachers were also supportive of a computer literacy program, only the parents and the school board needed convincing. District officials believed the best way to accomplish that would be through their children.

The Apple II Plus microcomputer the district had received was moved to the Superintendent's office at Alexander High School. School board members and their families were invited to a demonstration of the microcomputer and an introduction to the concept of computer literacy. While their children anxiously waited their turn on the computer, Board members decided that they would approve a computer program in the school district. They worked with the district staff and the Community Education Committee to devise a five-year plan to integrate computer literacy, as well as computer-assisted instruction, into all levels of the curriculum at the Alexander Local Schools.

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[1] Slobodian, June J., Ph.D., and Yeagley, Raymond, Ed.D.; "The Seed from Which an Oak Tree Grows: The Development of a Basic Skills Computer Literacy and Computer Education Programs in the Rural Alexander Local School District of Ohio." Alexander Local School District, Albany, Ohio; 1983.

The Assistant Superintendent, Dr. June Slobodian, was charged with seeking additional funds to purchase more microcomputers for the district. Many proposals were written and the district received a Consumer Economic Education grant from the state, a Basic Skills grant, for which they were awarded $11,000, as well as a $5,000 Computer Unit grant. These funds enabled the district to purchase more microcomputers without affecting the local budget--an important consideration in winning over any skeptical members of the community.

In 1982, three microcomputers had been added to the original Apple II Plus. Volunteers kept students moving through the Superintendent's office so that everyone could have an opportunity to work on the machines. School opened early in the morning and the doors were not locked until late in the evening, thanks to these dedicated volunteers. One man, Don Dillinger, was an unemployed accountant who decided to spend some time with local students as a volunteer. He was so proficient with the machines that the district wanted to hire him as a computer consultant. A limited budget, however, made it difficult to hire anyone for a full-time position. Because Mr. Dillinger is disabled, the district was able to get CETA funds. In 1981, Mr. Dillinger was hired as a Computer Production Assistant, and he eventually became the Coordinator for the Community Education Program.

Teaching About Computers

Teacher Training

Dr. Raymond Yeagley recalls the first time that teachers in Albany were confronted with microcomputers:

> The first thing that made me think about computers for our school was that I looked into our school records and found that the grade point averages and several other things had been figured on several different systems. They didn't agree, and I decided that we needed to have them agreeing with one another, so I wrote a program on a micro that we had here . . . to figure the grade points. Then I pretty much handed down a decision to the teachers: everybody is going to use this computer with my program and figure the grades and do the permanent records that way. The first year the teachers tried it, they really hated it . . . . The second year we tried it, everybody could hardly wait to get on it.

The teachers and staff at Albany were trained in a variety of ways. Several teachers enrolled in the state-sponsored inservice program offered through Ohio University. Some were trained by consultants sent by the Office of Public Instruction and the Appalachia Educational Laboratories in Charleston, West Virginia. Others learned on their own, from each other, or from faculty who had completed the inservice programs outside the district.

Computer Awareness for Students

Students in the district were thrilled to have computers as a part of their daily lives. The small town of Albany has little to offer in the way of commercial entertainment after school--movie houses and arcades are rare. Spending time on the computers before and after school and on the weekends was viewed by the parents as a learning experience and by the students as a form of entertainment.

Students at all grade levels spend roughly half an hour on the computer per week. All students--from gifted and talented to learning disabled--are assigned computer exercises. This arrangement helps to relieve the overcrowding that is a serious problem in most of Albany's four school buildings. Parent volunteers monitor groups of students who are sent in shifts to the library or another area to work on computer-related activities.

The district has noticed a remarkable shift in test scores and learning attitudes of children. For perhaps the first time ever, learning disabled students are proud of what they have accomplished in school. Their self-confidence is boosted and a kind of role reversal has taken place. Many of them responded to the computer so well that other students--not necessarily learning disabled--look to them for guidance and help on the machines.

Dr. June Slobodian, Assistant Superintendent, explains the positive effects the microcomputer has had on the students.

> I truly don't think you'll be able to stop any student who puts his hands on a computer from wanting to do something to communicate with that computer, and to create. That's a complete reversal from the way I felt originally. I think this is one of the most highly creative kinds of learning experiences a youngster can have. It calls for you to reason very logically and to apply and organize what's been learned. It teaches children that there are different ways of reaching the same results, some more efficient than others. It's been rather exciting to watch what's happened just in a visual look at our test scores. Our students score somewhat higher, significantly higher in many cases, in the skills area of a particular subject than they do in the application. They know very well how to sound out words, but when they sound them out and read them, they do not do nearly as well at understanding what they've read. They know how to add, subtract, multiply, and divide. They may not know when to do each function. It's obvious that the skills have very little value to them without the application. The computer has forced them into the applications. It has forced them to reason, to think.

The microcomputer serves as a supplementary teaching tool for drill and practice, enrichment, remediation, or demonstration in all subject areas. Extracurricular uses of the machines include activities such as composing the copy for the school newspaper on the computer's word processing program.

Parents

If any parents in Albany remained unconvinced of the microcomputer's value in the schools, the Community Education Committee served to persuade them. The precedent of parents, children, and teachers meeting together at school one night a week had been set with the consumer education program.

Don Dillinger became coordinator of these "parent nights" and brought microcomputers to the agenda. Mr. Dillinger gave a slide presentation to the parent/child teams to provide a basic familiarity with the equipment and vocabulary. He then assigned them to machines for exercises designed to make them more comfortable with the equipment. It was from this group of parents that the district recruited its substantial pool of volunteers. As the ranks of volunteers grew, the demand for evening and weekend classes increased. The Superintendent, Assistant Superintendent, and teachers from the Alexander staff spent their spare time teaching these community education classes and encouraging parents to volunteer during the school day. Kit Daily, a parent volunteer and former teacher, notes:

> If I were to go back to the classroom now, I would want a computer in my room; and I would like for the textbook company to supply me with some sort of floppy disk that would go along with the textbook.

Selection and Use of Hardware and Software

The district has been careful to choose a variety of hardware for the schools. They own Apple, Commodore, Sinclair, and Radio Shack machines. Dr. Yeagley explains the rationale:

> We like the variety because we don't want the kids to just learn one kind of instruction or one set of commands for the computer and just memorize those. When they get out into the business world or wherever they're going to go, they may not have all Apples or they may not have all TRS 80s. They may be on a mainframe. We want them to be able to handle new situations, new computers, and to get the idea across that it's all basically the same logic. They just use some different words.

To ensure easy accessibility, the micros in the high school are generally kept in the Superintendent's office, the library, the cafeteria, and in the halls on rolling carts. At the smaller elementary schools, the machines are placed in a separate classroom. Students are sent to this area in groups to work on supplementary programs in spelling or math. Parent volunteers monitor and give assistance to needy students, eliminating the need for extra teaching staff. Many students, however, can't get enough time with the computers; they work on them during the lunch hour, before class, after school, and with their parents one night a week in the high school library.

Software in the district comes from many sources. A large number of the programs are developed internally. As Computer Production Assistant, one of Don Dillinger's responsibilities is to write software for teachers.

> We don't have to buy software for them to teach around. We develop the software so they can use the software in teaching the way they want to teach. It also enables them to talk to me about how they want a program set up.

Early in the computer program, the Alexander Local Schools were selected by the Appalachian Educational Laboratories (AEL) in Charleston, West Virginia, to pilot test reading software. The only prerequisite was owning a microcomputer. The district had inherited a machine from the gifted and talented program grant when Sue Holzaepfel, the head of the program, left. AEL provided the district with reading software designed for ninth graders in remedial reading classes. The lab sent a consultant to the district to train two secretaries in the Superintendent's office to serve as teacher aides. Parents were able also to take advantage of the consultant's services. In exchange for training, they agreed to volunteer their time after school and in the evenings to allow parents and students to work on the microcomputers.

Electronic Learning contacted the district and offered a cooperative software review arrangement. The staff agreed to review software sent by Electronic Learning in exchange for the privilege of keeping any programs they considered worthwhile. Additional programs are purchased from vendors or through journals.

Computer Applications

The district uses microcomputers with students from grades K-12. Drill and practice, remediation, and enrichment comprise the majority of uses in the schools. Activities include programs written by the staff to help students in math, reading, spelling, and grammar. These programs are designed to drill students and reinforce their skills in these areas. The district also uses microcomputers to teach typing, and various aspects of math and reading. Some of these programs are developed locally. Students use word processing to revise and edit compositions and reports, as well as articles for the school newspaper.

In the upper grade levels, students use the machines to learn programming and for business applications in areas such as accounting. The district staff buys and designs software to teach students how to write programs of their own. Students also use authoring programs to build programs for other students. Teachers use these pilot programs to design coursework for their classes. The superintendent recently developed a microcomputer program to prepare and revise the district's language arts curriculum.

In the administrative offices the machines are primarily used for word processing, inventory, payroll, scheduling, grade reporting, and food service management.

Additional Information

For more information about the Alexander Local School District in Albany, Ohio, contact:

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Box 337
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(614) 698-8831.

References

"The Seed from Which an Oak Tree Grows: The Development of a Basic Skills Computer Literacy and Computer Education Program in the Rural Alexander Local School District of Ohio." June J. Slobodian, Ph.D., Assistant Superintendent, and Raymond Yeagley, Ed.D., Superintendent.

CINCINNATI, OHIO

DISTRICT SUMMARY

- Urban school district in Southwestern Ohio
- Major employers include large corporations, such as Proctor and Gamble, General Electric, Milicron, and Federated Department Stores
- District enrolls approximately 51,000 students K-12
- Mixed student population, more than 50% minority enrollment
- Began using a time-shared mainframe in the late 1960s to improve basic skills instruction; the district uses mainframe computers for instructional management and is moving to micros for instruction at the school level
- All secondary schools and more than 75% of the elementary schools have at least one micro; a mix of brands is used including Apple, TRS-80s, Atari, and Texas Instruments; approximately 220 microcomputers in the district's 78 schools

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History

Cincinnati began using a mainframe computer in its instructional program in 1968 to support basic skills instruction. Terminals in the schools were connected to a central computer to deliver drill and practice programs. Administrative functions (such as payroll and accounts payable), and management functions were supported on a separate computer.

The various uses of the computer placed considerable demand on the system. When there was competition for computer time, administrative functions typically won because they had the highest priority. The instructional units became frustrated by their low priority on the system and generated support for a separate network for instructional and management applications. They began with a mini-computer that eventually grew to four machines for instruction and management. By the end of the 1970s the district was concerned about the expense of operating two independent systems that at times duplicated effort. A move was initiated to consolidate in one system.

Also during the late 1970s, school-level administrators became frustrated with the centralized approach to computer usage for instruction. Disruptions of class schedules and lesson plans occurred each time the mainframe computer went down. School administrators began looking for stand-alone devices that could deliver instruction in the schools. The microcomputer presented itself at that time as a viable alternative to a centralized approach to delivery of instruction. Principals and teachers began exploring this new technology and acquiring it for their schools.

The introduction of microcomputers started in a decentralized manner in Cincinnati. As the numbers of microcomputers grew, the central office became aware of the need to exercise some control and direction. It has instituted training courses for school personnel, centralized guidelines for purchasing hardware and software, and a microcomputer clearinghouse to support the schools' activities.

John Grate is Director of the Resource Planning and Development Branch, the group responsible for managing instructional computer applications. He describes the district's current decisions on when to use micros and mainframes.

> We made a decision in this district to retain on the mainframe computer those pieces of the program, such as instructional management, that would allow us to follow a student wherever he would go in the district, but that we would sever our delivery of direct instruction to a student. That proved to be a very important decision for us in that it freed up a great deal of resources to locate things directly at the school. If there is a malfunction it wouldn't knock out huge numbers of students and numbers of schools at one time. It enabled us to provide a greater terminal capability than we could with the mainframe computer. For a fraction of the cost, we obtained color and voice, as well as graphics.

The district has used its funds to support instructional record keeping on the mainframe. State and federal funds for disadvantaged students, gifted and talented students, and block grant money have been used to purchase microcomputers. Much of the purchasing has been done locally by the individual schools. Each school is given an instructional supply account, which is a portion of the general fund that can be allocated as the school sees fit. Some principals have elected to use these funds to purchase microcomputers for their schools. In addition, the district has instituted a local school budgeting process that has provided funds for purchasing microcomputers and operating computer programs. John Grate explains that this process permits "principals working with teachers, parents, and community people to review the standard allocation to the school and to reassess the way that allocation is spent. They can make changes to provide program funds in another area. An example of that kind of activity would be the decision to do away with a custodian position and then use that money for a computer program they want to implement. Donations by PTAs and private companies are other sources of funding used in Cincinnati." Cincinnati has had active support for its program from the community and the business sector.

Computer literacy was not the central thrust of Cincinnati's early efforts. Microcomputers were used to support basic skills instruction, particularly reading and math skills. The district is now interested in a computer literacy program and has developed a program for selected grades in the past two years. Administrators hope to have a district- wide K-12 computer literacy curriculum soon. They are studying commercial literacy programs, as well as those developed by other districts, and expect to be able to put together a program from those resources.

Learning About Computers

Teacher Training

Teachers and administrators are learning how to use microcomputers on their own time through programs organized by the district, the schools, and outside courses. The district sponsors a Professional Growth Institute that offers credit and non-credit courses on a wide variety of topics ranging from swimming lessons to computers. In the fall of 1982 the district sponsored five computer-related courses. Tony Valerius, the head of Cincinnati's microcomputer clearinghouse, describes these courses. One course "deals with a very basic introduction--how do I turn the computer on, how do I put in a disc and start a piece of software? The other classes get into programming--manipulating the computer--so that teachers are actually writing their own programs in BASIC or PILOT." He explains that classes are limited to about 18 people so that all participants have adequate time for hands-on practice. All school staff from cafeteria help to teachers and administrators can participate.

Schools have organized their own teacher training programs. Frank Mack, the principal of Hyde Park Elementary School, involved parents in the training program at his school. "One father has really guided us on purchases and he helped Mrs. Browsh set up the training. The initial training was for all teachers; they signed up for a ten-week course. Then another father came in to help. He was unemployed at the time and was glad to help. Between the two of them we did get some good training." At another school, the principal, Betty Ottesen, also noted that a parent who was a university professor provided two classes for teachers on an introduction to microcomputers. Her aproach has been to slowly introduce teachers to microcomptuers. "I haven't made anybody do anything, I've suggested. We had two sessions during regular staff meetings; every one of the teachers attended. We have had five people, including an instructional aide, take courses at the Professional Growth Institute."

Many of the school leaders in microcomputing are self-taught. Ginny Browsh, the computer literacy aide at Hyde Park Elementary, is typical of this group.

> I was hired in the fall of 1980 to come in and help with an instructional management system that the Cincinnati public schools had been using. There wasn't anything to do right then and we had the microcomputer in the school. Mr. Mack said, 'Why don't you start working on the microcomputer?' I had never even done anything with a microcomputer before that time, and I sat down and I just started working with it, and then we started trying to decide how to utilize it within the framework of the school.

Computer Literacy for Students

Individual schools have created computer literacy programs at the building level. Lloyd Watts describes the content of the computer literacy course he is teaching. "The course contains materials on learning the importance of the computer, the history of the computer, logging on with the computer, flow charting, and writing basic programs. We think all these skills are necessary at this level."

Ginny Browsh's elementary level computer literacy program works with groups of about 10 students at a time. She teaches the group one hour per week for 10 weeks. Her curriculum is organized into two five-week segments with a break in the middle for students "to mull it over in their minds, get some more exposure to computers, and then come back again." She works with all 400 children in the school, grades K-6, and structures each class to the age and ability level of the students. "What I do with the older kids is give them a lesson in which we go over something together, and then write an assignment on the blackboard. Many times they help me write the assignment... We write the assignment down one, two, three, four--almost like a flow chart you would do in programming. So they get the same idea in several different ways."

Cincinnati is now involved in compiling a K-12 computer literacy program for the school system as a whole. John Grate, Director of the Division of Resource Planning and Development, says,

> We feel that a computer literacy program has to go in place pretty quickly. We are piloting the Montgomery County, Maryland, materials at one school and we have a number of things going in some of the junior highs. We are looking at what they should be doing, but we really haven't defined in a very concrete way where we expect to be next year. That's a job to be done.

Selection and Use of Hardware and Software

Cincinnati established a Computers in Education Articulation Committee (CEAC) in 1979 to stimulate use of computers in education and to foster computer literacy for teachers and students. CEAC established a subcommittee on microcomputer coordination to:

- develop and periodically review guidelines for selecting hardware
- formulate criteria for selecting and using microcomputer software; and
- establish a clearinghouse for microcomputer software.

This subcommittee developed hardware specifications and software review procedures.

The district evaluated various brands of microcomputers against criteria relating to memory, support disk drives, language capabilities, resolution, and maintenance record. Initially they approved three brands: Apple, TRS-80, and Atari. Later two more brands were approved: Texas Instruments and Commodore PET. John Grate explains that several brands were approved because universal software was not available and the district did not want to be limited to software for only one brand of microcomputer. They are now questioning whether five brands is too many because the district is trying to provide software, maintenance, and inservice support for all micros in the schools. The district reviews all microcomputer purchases, even those made with PTA funds.

To help schools make wise hardware and software decisions, Cincinnati operates a microcomputer clearinghouse.

> We have most of the approved computers in the system on display here, including Texas Instruments, Atari, Radio Shack, and Apple. They are available for teachers to come down and use along with software, such as the MECC software (we're an institutional member of that organization). Radio Shack and some of the others have left demos here, things for us to show the teachers... We try to provide magazines and books that would also help to broaden teachers' knowledge and keep them up to date. (Tony Valerius, Clearinghouse Director)

The clearinghouse publishes a catalog of approved software. It is designed to be inserted in a three-ring binder so that it can be updated regularly.

The district uses commercial software, public domain software, and software developed internally. As an institutional member of the Minnesota Educational Computing Consortium (MECC), Cincinnati has access to all MECC courseware; it is available to district schools free of charge.

Commercial software is carefully reviewed before schools are allowed to purchase it. Supervisors and teachers review instructional software before it receives approval from the central office. Procedures for the review were changing at the time of the site visit because the district was beginning to work with the EPIE Institute to evaluate software. Courseware is listed in the clearinghouse catalog only after it receives a positive review.

Provision has been made for cases where a teacher finds some commercial software he or she would like to use that has not yet been reviewed centrally. The school may convene teachers from the appropriate subject area to review the material and make a recommendation to the principal. With the principal's approval, the software may be purchased by the school; however, it still must undergo central review before it is listed in the clearinghouse catalog and is approved for purchase districtwide.

Teacher and district-developed software are also used.

> This past summer we had about seven high school students who were recruited from our computer science classes in the district; they were employed throughout the summer on an hourly basis to develop

> some of our minimal competency instructional units for the Apple. Later we'll translate them to other equipment that we have in the district. These units had already been developed by teachers; they had gone through pilot testing in a paper and pencil mode and what we were trying to do was to provide an alternative on microcomputers for the paper and pencil mode. The units that the students developed have been very successful. (John Grate)

Teachers develop software for use in their own classrooms. For example, one teacher, working with her high school son, developed a spelling program to accompany the spelling text. Another teacher prepared a program for a Latin class.

The district has a mixed view of teacher-developed software. It recognizes the motivational effect of allowing teachers to prepare their own software, but it is concerned about the time required to do the programming, the quality of the materials, and copyright ownership.

Because of concern about the quality and shelf-life of commercial software, teachers are exploring other methods of obtaining materials. Kathy Donovan, a teacher at Burton Elementary School, states that her school has found that leasing courseware is a good alternative. "Textbook companies are leasing programs. In a couple of areas, we decided to lease a program for our Apple rather than buy it because in the next year or two we may decide that it's already antiquated and we want something different. So we'll put $100 into leasing as opposed to $1,000 for purchasing..."

Computer Applications

Computers are used in Cincinnati for instructional applications, managing instruction, and administration. Examples of each type of use are presented below.

Instructional Applications

- Burton Elementary School has more than 30 microcomputers, many donated by Texas Instruments in a cooperative effort with the publishing firm, Scott-Foresman. The machines are being used to pilot test basic skills materials developed by Scott-Foresman.

- Kathy Donovan, an elementary school teacher, has written a Latin vocabulary program for fourth, fifth, and six graders to reinforce what they learn in class. The program reinforces Latin vocabulary and introduces students to English derivatives.

- Ginny Browsh has lunch classes and other programs for elementary school students who are particularly interested in working with the computer. Each grade is assigned a day of the week: on the appropriate day, teachers select students to go to the computer lab during lunch. The children decide whether they want to play games, practice programming, or do another activity.

Ms. Browsh also has a club called Order of the Apple. Children who pass a computer literacy test become club members; they are then eligible to help teachers who want to use micros in their classrooms.

- Nancy Hoffman has an Apple and a Texas Instrument computer in a computer center in her first grade classroom. The children use the computers to run reading and math programs. She says, "It's immediate feedback. I'm not always right there to tell them if they are doing it correctly or incorrectly, but the computer is able to do that."

- "I'm using the computer in calculus class to demonstrate some graphic functions. In the statistics class I'm using computers to do the arithmetic. In other words, the students do not learn anything about programming; they just take a program, type it in, get the computer to run it, and get the answers. In the computer programming classes, the students are actually learning how to program." Chester Kalb, teacher at Woodward High School.

- Lloyd Watts, a high school teacher, teaches programming but does not emphasize this application. He is introducing teachers and students to simulations on the microcomputer. We use the microcomputer "in geology for earthquake simulations and mineral and rock identification. We use it in biology with environmental simulations, animal simulations, food chain simulations. In chemistry, we're using it with titrations, studying the laws of molecular motion and diffusion. And it's being used in physics for studying harmonics and wave motion."

- Lloyd Watt describes how the computers are distributed in the school. "We have been using computers in a number of different situations as far as class size is concerned. They are moved around into individual classrooms as teachers need them. In some cases, we use them on a remedial basis where we have one, two, three or a small group of students using them. We use them in classroom size simulations. We also have the ability to use them in large group situations--up to 80 students. We have a small auditorium with four monitors spaced around the room and the teachers and the students can interact."

Computer-Managed Instruction

The district has developed the Cincinnati Instructional Management System (CIMS) to help teachers manage information about their students. The program is run on a mainframe computer and is used district-wide. CIMS is a criterion-referenced testing system that monitors students' progress in the basic skills. It acts as a computerized "file cabinet" of all data on the student and the skills he or she has attained. It produces information on the skills covered in a course of study and indicates which of them each student has acquired. The system has the ability to produce reports, by student, for teachers and parents. It can also identify all students who have the same deficit. Specific skills in CIMS are considered minimum competencies for students in grades three and six. Reports on the minimum competency skills can be used to schedule remediation.

Teachers are developing their own management tools for the microcomputer. Kathy Donovan, for example, has written a management program that records her students' scores. She believes it saves her a lot of time.

Administrative Applications

Chester Kalb developed a variety of computer programs for Woodward High School.

> We type in all the absences and tardies and early excuses and suspensions each day, and then the computer generates an absentee list. The teachers get an alphabetical list of every one that's absent in the school. The administrators that have grade levels get a list that's just the kids at their grade, and each counselor responsible for a grade level also gets one of those lists. The computer also can generate referrals for the truant officer, it can make alphabetical lists of any class, it can make numeric lists, it can print out address labels, lists of phone numbers--just about anything you want. It also does all of our state foundation attendance reports.
>
> We've noticed over three to four years that the reliability of information is tremendously improved. We had teachers recording information in their grade books in different ways, and it was hard to decipher that information. Now everybody's recording the information the same way and it's more standardized.

These programs are all run on the district's mainframe. Initially there was no other alternative, but in the past year microcomputers with the capacity to handle this information have come on the market. Mr. Kalb believes the school could save enough money by switching to pay for the cost of the microcomputer.

Spring 1983 Update

An Educational Technology Task Force has been established to develop a long-range plan for the systematic use of technology to improve education in the Cincinnati Public School system. Where appropriate, the Task Force will also make recommendations for the involvement of other public and private institutions in the plan. The Task Force will review and study present and projected applications for the most effective and cost-efficient means of delivering services. It will also make recommendations to the Board of Education and administration regarding purchase, installation, programming practices, and cooperative ventures for the various types of technologies.

The membership of the task force includes representatives from the Cincinnati Public Schools Board of Education and administration, the city administration, local business and industry, local colleges and universities, social agencies, parent groups, and community organizations.

The task force has identified four subcommmittees to facilitate its efforts: Computer Literacy, Instruction, Management, and Training. The group is expected to complete its work by July 1983.

Additional Information

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References

The following items have been written about the district's programs.

1. Cincinnati Public Schools. "Process of Management and Use of Microcomputers and Associated Software and Courseware." May 6, 1982.

2. Cincinnati Public Schools. "Educational Uses of Technology 1982-1983." April 27, 1983.

FAIRFAX COUNTY, VIRGINIA

DISTRICT SUMMARY

- Suburban county in the Washington, D.C. Metropolitan area
- Government and high-tech industries are chief employers; median family income $41,600 in 1981
- Tenth largest school district in the U.S.; enrolls 122,600 students, K-12
- Began using time-shared mainframe in late 1960's for data processing and computer science; now using micros for these subjects and computer literacy in K-12
- Estimated 584 micros, primarily Atari and NEC, in the 159 schools in Fairfax County

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History

Fairfax County began using a time-shared system for administration and high school computer science instruction in the late 1960s. The focus was on teaching about computers, rather than computer-assisted instruction (CAI), because not enough equipment was available to support a CAI program. The county continued with this emphasis throughout the 1970s. By the mid-1970s, the system was not adequate to handle the number of students enrolled and problems of delayed turnaround and long downtime were common. A need for greater local control was recognized, but funds for purchasing new equipment were not available. In addition, there was interest in expanding the computer literacy program to the middle and elementary schools. However, with funding limited and problems with the time-shared system, this did not seem a realistic goal.

At this time, Mr. Marvin Koontz, the County Director of Instructional Technology, met Dr. Richard Lavine, principal of one of the elementary schools. They discovered a mutual interest in establishing a computer literacy program at the elementary level and began working together to develop a small program at Dr. Lavine's school. After-school classes were held for teachers using a terminal hooked to the county's central computer. Out of these efforts grew a preliminary computer literacy curriculum for grades K-6 that did not require extensive hardware and that could be incorporated in the existing curriculum. This approach was informally tested at several elementary schools in the late 1970's.

The emphasis on technology and computer literacy began in 1980 when a new superintendent, who had a background in technology, was selected. He was surprised that the county was not more advanced in its use of computers for instruction and administration. The Superintendent, Dr. Linton Deck, as well as Mr. Koontz, Dr. Lavine, and other interested educators, began an effort to convince the school board that computer technology should become a more integral part of the curriculum and the school system. They used informal and formal channels to influence the decision makers. Activities included hands-on sessions where educational applications of the technology were demonstrated. A blue-ribbon commission was set up to advise on the proposed technology directions for the district. The commission was composed of executives from organizations in the area that use high technology in their work; they supported an increased emphasis on technology and recommended that an outside consultant with expertise in computer technology be hired to help develop a long-range plan. The school board and Superintendent accepted this advice and hired the firm of Cresap, McCormick, and Paget to assess the county's needs and suggest methods of addressing them. The consultant's report recommended that funding be provided for a major computer initiative in the schools and for increased use of computers for administrative purposes.

A limited computer literacy program was recommended to gain first-hand experience before expanding any technology effort county-wide. The limited program utilized a "pyramid concept" that involved introducing the computer literacy curriculum at two high schools and at one feeder intermediate and one feeder elementary school per high school. Thus a group of students could begin in an elementary school and experience an integrated K-12 curriculum. A planning committee that included Dr. Lavine and other principals decided that each participating school would receive four micros, four disk drives, four monitors, and one printer. Four pieces of equipment were considered the minimum number of computers needed to provide adequate hands-on exposure for students. The first pyramids were built with funds from Title IV-B of the Elementary and Secondary Education Act; no county funds were involved.

Parent and community pressure rapidly overtook the planned slow implementation policy:

> We had a plan that said we would buy a certain number of microcomputers and over a five-year period we would be able to cover all elementary schools. Well, money was shifted last year to the intermediate school program through expressed concerns of certain school board members who wanted to make sure that all the high schools and all the intermediate schools had the equipment. If we outfitted our elementary schools prematurely we might have certain gaps in our pyramid that would not be understandable to the public who would want to know "Why can't my child have a continuing program?" So PTAs have shown leadership and have acquired a significant number of microcomputers. We will have more than 40 elementary schools ready to partially or fully implement the K-6 computer literacy program next year. (Marvin Koontz, Director of Instructional Technology).

In addition to purchases by PTAs, microcomputers are being purchased by the district office using a combination of local and Federal funds.

Learning About Computers

Teacher Training

Initiating a computer literacy program requires trained teachers who are comfortable with the technology and can use it in their classrooms. Fairfax County has developed its own teacher training program to meet this need. Training is voluntary and involves only interested teachers.

"The elementary training program emphasizes training some teachers from a given school and then letting those teachers be the missionaries within their own schools," says Dr. Richard Lavine. One of the earliest teacher training programs was at Wolftrap Elementary where he was then principal. For three years Marvin Koontz worked with teachers and students at Wolftrap. He began with "a CRT in a little closet in a little room in a little school building. In other words, we had access to no real equipment, but there are a lot of things that can be taught teachers and students that don't need a whole lot of equipment," says Mr. Koontz.

The elementary training emphasizes how computers can be integrated with the existing curriculum, rather than computer programming. "What I tell teachers is that it's not so important to learn a language, but it is important to know how to use what's out there. Information retrieval, being aware of the kind of software that's in the field, being comfortable with the keyboard, being aware of the implications of computer literacy for children and adults--these are more important things than learning BASIC," according to Dr. Lavine.

Many teachers who were involved in the early teacher training program at Wolftrap became interested in the technology and sought additional training on their own. Fay Morrisson, a former teacher at Wolftrap and now an area resource teacher for computer literacy is typical of this group. She explains:

> We had in-service time on Mondays and Marv Koontz came to the school and trained teachers on our time and his time. I sat in on a lot of those sessions. It was very heavily programming and I enjoyed it. I didn't see any use for it in my classroom because I was a first- and second-grade teacher but I was fascinated with the math angle and, being a former math teacher, it appealed to me. The following year I took a data processing course as part of a doctoral program, became very interested in it, and as my project wrote a curriculum for K-2.
>
> At that same time a committee was working in the county and most of the teachers involved in it were in my school. They were trying to develop a program for grades K to 6. I worked with them. We got four micros into the school the next year; I brought one into my classroom and tried to see how much I could do with the children. It just grew with my interest and the children's interest.

The secondary teacher training program has become more formalized over the years. A packet of materials was put together for teacher training, and after-school classes were organized. During 1982-83, more than 20 classes were taught each semester. Margaret Hook, one of the teacher trainers, describes the content of the course:

> We're doing essentially the same things we do with students. We teach them computer concepts, what a computer is, the limitations of computers, the impact they have made on our society, and how to program a computer. We have some teachers who are now ready to delve into software development... and we taught them programming to do that.

Computer Literacy for Students

A student computer literacy curriculum for the students was written over a summer by district teachers. It was field tested during the school year and revised the following summer. Fran Gallagher, a former teacher now serving as elementary school computer specialist for the district, explains the development of the elementary school computer literacy curriculum. "Everything that was written had already been tried in the class. So if it said 'first grade,' it had been tried in the first grade. This has really been a fine selling point for our teachers--that it was developed from classroom experience and not some specialist up here (i.e., district office) telling you this had to be done."

"The elementary school curriculum is entirely integrated. We have taken the elementary Program of Studies and developed strategies that will integrate, so the teachers do not feel an extra burden."
Ms. Gallagher explains that the program has four units: (1) how the computer works, (2) computer applications, (3) impact on careers, and (4) using the computer. She emphasizes that only the last segment of the curriculum depends on access to equipment.

Pat Minnis, one of the authors of the intermediate school program, explains the focus of that curriculum:

> The materials were designed to be used in all math classes, no matter what level--advanced or students who have difficulty in math--a very general curriculum guide. It goes through some of the programming statements. A lot of the activities involve computer applications. Students have articles to read, projects, movies to view, and at the same, they have programs to write. It covers the whole scope of programming, computers in the home, computers in the future, computers in careers... The county is now publishing the booklet and it will probably be available in January 1983.

R.C. Bosley, principal of Kilmer Intermediate School (one of the schools involved in the original pyramid), explains that the elementary program is very basic, the curriculum becomes more involved at the intermediate level, and covers more computer applications at the high school level. This approach is satisfactory for the moment, but he predicts a need to revise the curriculum soon. "Our program will be good for two or three years. After that we're going to have to change it because youngsters will be coming up with more knowledge than what we're presenting (in the intermediate school) at the present time." This concern has created a thrust for a computer lab at the school, that would permit greater use of microcomputers in the instructional program.

Selection and Use of Hardware and Software

Fairfax County relies largely on Atari microcomputers for its computer literacy program. The initial purchase decision was made on the basis of a competitive bid. The MECC model was used for writing an RFP; it specified that the vendor had to provide one year of on-site maintenance. This provision was added because the county lacked money to fund a maintenance program. Only one vendor included this provision in its bid, and that bid was for Atari equipment.

The county has continued to buy Atari equipment and encourages elementary schools that buy their own equipment to select Atari microcomputers as well. Other brands may be purchased with school or PTA funds, but the county provides maintenance and training only on Ataris. This restriction has proven a powerful incentive for most schools to limit their purchases to the county-approved brand.

Atari computers were fairly new at the time Fairfax County began buying them and little software was available for them. This situation did not worry planners because they intended to use the county-developed computer literacy curriculum. They believed that by the time they were ready for educational software it would be available. This assumption has proven correct, according to Marvin Koontz.

Various hardware deployment patterns are used in different schools and patterns have changed as teachers gained additional experience and schools acquired more equipment. At Kilmer Intermediate School, the eight micros are on carts that are stored in a locked closet at night and rolled into the classroom during the day. "The first year we set up for each teacher to have four microcomputers for a three-week period.... Last year we did a similar thing first semester, but we did it for three weeks, and then second semester each teacher had four computers once every two weeks....This year we have eight computers and each teacher gets eight computers every eight or nine days," according to Pat Minnis. She handles her math class by dividing students into groups. The day before the computers are planned for her classes, she sets up a schedule so the students know who goes first and what they are to work on. Students work in pairs.

Woodson High School has two small computer labs: one for computer science and one for business and data processing. The labs house microcomputers and terminals tied to the district's mainframe. Additional microcomputers are on carts that can be rolled into a classroom. The school is planning to build a new computer wing where all the microcomputers and terminals can be housed together.

Fairfax County relied heavily on teacher-developed software to begin its program. One reason was that little educational software was available for Atari microcomputers at the time. Several teachers preferred to develop their own software anyway. "Software's a real problem," says Barry Sperling, a teacher at Stephen Foster Intermediate School. "For one thing there are so many things to be done that you're going to wait hundreds of years before you find a program that will do exactly what you want it to do. Therefore you really must write your own software." Margaret Hook explains, "You wouldn't think of using someone else's lesson plans. Would you think of using someone else's software? You develop the software to meet your needs."

An effort is now being made to identify appropriate commercial software. Fran Gallagher at the central office reviews and evaluates commercial software as part of her job. She maintains that much of the early commercial software provided "a shallow experience for students." She continues "When I look at software, I'm looking for generic types of software, generic intellectual skills--problem solving, critical thinking, directionality, visual discrimination, visual memory--skills that can be applied to any situation....I look for the software's appropriateness in terms of content, format, reading level, documentation, and whether or not I have preview rights." Ms. Gallagher frequently previews the software with the curriculum specialist to determine what grade it is appropriate for.

But a focus on teacher-developed materials continues. "One of the things we've been trying is to have teachers develop skill in specifying what they want and then working with students to develop the program," according to Gerry Barry, a district administrator involved in assisting teachers with microcomputer use at the secondary level.

Computer Applications

In addition to the computer literacy thrust already described, teachers are finding many other ways to use microcomputers in the schools.

Applications at the Elementary School

- The Atari PILOT language, similar to LOGO, is used in Fairfax County's elementary schools to teach problem solving. "We want the children to realize that they need to think in small modules--that they piece the puzzle together, and the order in which they put the puzzle determines what the result will be on the screen." Fran Gallagher describes that they begin by learning how to draw a box and then ask children what they would do next to turn the box into a house.

- A word processing program is being used at Greenbriar East Elementary School. Fran Gallagher explains how it works: "The children are writing their compositions with paper and pencil and parent volunteers are typing the compositions into the word processor. Once the parents have the compositions typed (and the hardest thing is not to correct as they are typing it), they print a hard copy for the children. And with a small group of children, they go through it and look for the errors that have been made, whether it be spelling or grammar or if they have to move blocks of text, or whatever. Once they go through that proofing, the children go to the keyboard and do the editing."

- A music teacher uses a music composition program that allows children to compose in four voices. She explains that the program helps student learn pitch, rhythm, and harmony.

- Fay Morrisson used a variety of programs with first and second grade students. "Some on telling time, some on the order of 'Concentration Game' where the children would match symbols and letters, perceptual kinds of activities. We also used the PILOT language...as a predictive activity. I would put a line of program on the screen and have the children predict what it would do."

- Games are being used with LD students to motivate and to strengthen hand-eye coordination.

Applications at the Intermediate School

- "We're trying to design an instructional lab in which the computers would be used for computer-assisted instruction, practice problems, or anything we can get our hands on to get into the content area," explains R.C. Bosley, principal at Kilmer Intermediate School.

- Barry Sperling speaks of the applications at Stephen Foster Intermediate School: "We can make the machine talk to kids so we can use it as a surrogate teacher for CAI....Then we started looking at other things we could do....For example, our librarian has written a program to explain how reference books are used. For ESL students, the students type in something in their own language and the computer answers in that language."

Applications in the High School

- Sue Kunihiro teaches a Consumer Math Class for slow learners. "They are very insecure about their basic skills, so they feel when they do an exercise they want to check the answer with me. (The computer) is another way they can check. They can sit down and there's nobody saying 'No, you're wrong'... there's no human being giving you negative feedback."

- The business classes learn data processing and word processing. There is also a computer science curriculum.

Spring 1983 Update

The number of microcomputers in Fairfax County continues to grow rapidly. County officials expect to have 700 microcomputers in the schools by the fall of 1983. This growth is related in part to an acceleration of the plans for equipping the elementary schools. Because of community pressure, the county has requested funds to place at least one microcomputer in each elementary school by December 1983 and to have trained at least three teachers in each school by that time.

Additional Information

For further information on Fairfax County, contact:

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PANEL DISCUSSIONS AND VIDEO NEWSLETTERS

The panel discussions and video newsletters were originally telecast as segments of the four major Project BEST video teleconferences. Reaction to these segments was so positive that we believe they could stand alone and be used as discussion stimulators for inservice training sessions. Consequently, discussion guides were developed to accompany these video materials.

The panel discussions involve persons with experience in technology implementation. Panel members share experiences, engage in an exchange of ideas, and respond to questions posed by panel moderators, program viewers at the state sites, and other panel members. These panel discussion segments address various issues related to an overall topic. Discussion leaders are urged to preview both guide and tape.

Titles of the panel discussions are:

State Education Agencies and the New Technologies -- telecast October 1982

School-Industry Cooperation and High Technology -- telecast January 1983

Becoming Literate with the New Technology -- telecast May 1983

Guidelines for Hardware and Software Selection -- telecast June 1983

Computer Applications in the School -- telecast June 1983

The Project BEST Video Newsletters were designed to give Project BEST participants current information about federal, state, and local activities in the use of technology in the schools. They showcase training and staff development materials, curriculum guides, and other available audio and video materials. The guides for these newsletters provide an overview of the content of the newsletters and information on how to obtain showcased materials.

PROJECT BEST VIDEO NEWSLETTER #1

October 27, 1982, Teleconference

This first video newsletter formed part of the October 27, 1983, teleconference (Organizing for Technology at the State Level) in which information on technology and/or basic skills education was disseminated to the Project BEST State Team Leaders. The 30-minute video newsletter was an experimental effort of Project BEST to distribute current information on educational products, activities, and services in a video format at the local, state, and national levels. The newsletter demonstrated the power of video technology to present specialized information to an audience that can make immediate use of it.

This first Project BEST video newsletter was transmitted via satellite during the down-time on the October 27 teleconference and recorded on a videocassette at each receiving site. During the transmission, the 41 state sites participated in a 40-minute audio teleconference. At the conclusion of the audio bridges, the sites were able to view the video newsletter. In the process cost-effective use was made of the 2-hour block of satellite time purchased for the teleconference.

Once the video newsletter is screened by all interested parties, the content, which has a shelf-life of 30 to 45 days, can be erased and the tape can be used to record subsequent newsletters.

GUIDE SHEET

INFORMATION PRODUCTS PRESENTED ON OCTOBER 27, 1982

PROJECT BEST VIDEO NEWSLETTER

	ITEMS	SOURCE/CONTACT
1.	Videotapes from Virginia "Videotape, Disc, or . . .?" "Microcomputers and Instruction"	Mary E. Dalton Supervisor, Telecommunications Virginia Department of Education P.O. Box 6Q Richmond, VA 23216
2.	Handbooks from the State of Washington Introduction So You Want to Use Computers Programs Resources Practitioner's Directory	Sue Collins or Elden Egbers Office of the Superintendent of Public Instruction Division of Instructional Programs and Services Old Capitol Building Olympia, WA 98504
3.	Videotapes from North Carolina "The Micro Challenge" "Micros in the Media Center"	Elsie L. Brumback Deputy Assistant Superintendent Area of Support Services Room 250 Department of Public Instruction Raleigh, NC 27611
4.	Videotape and floppy disk from Basic Skills Management Program in Tennessee (Basic Skills First)	Mr. Beecher Clapp Assistant to the Commissioner State Department of Education 813 Broadway at Gill Knoxville, TN 37917
5.	Books from CEMREL: Catalog of State Basic Skills Products	Harriet Doss Willis CEMREL, Inc. 3120 59th Street St. Louis, MO 63139
	Basic Skills Issues and Choices	Far West Laboratory for Educational Research and Development 1855 Folsom Street San Francisco, CA 94103 Contact: Richard Clifford

(5. . . . continued)

Frank Porter Graham Child
Development Center
University of North Carolina
Room 500, NCNB Plaza
Chapel Hill, NC 27514
Contact: Margaret Robinson

The Network, Inc.
219 South Main Street
Andover, MA 01810
Contact: John Collins

Northwest Regional Educational
Laboratory
300 S.W. Sixth Avenue
Portland, OR 97204
Contact: Jack Allen

6. NDN Projects
    - Project Coffee -- Oxford, MA
    - Project CAM --Hopkins, MN
    - CAI -- Chelmsford, MA
    - Utilizing Computers in Teaching Mathematics -- Asbury Park, NJ
    - Project MARKS -- Norris City, IL
    - Project "I PASS" -- Pawtucket, RI
    - CADPP -- Dilwyn, VA
    - Project Clover -- Little Rock, AR

Lee Wickline
National Diffusion Network
Riviera Building
Room 802
1832 M St., N.W.
Washington, D.C. 20036

7. Computeronics

Pristen Bird, Director
Gifted Child Project
2757 W. Pensacola St.
Tallahassee, FL 32304

8. OTA Study: "Informational Technology and Its Impact on American Education"

(Free Summary)
Office of Technology Assessment
Publications
Washington, D.C. 20510

(Full Report)
GPO Stock No. 052-003-00888-2
($8.00)
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

9. Belvidere Center School (Vermont's one-room school house)	James Lengel, Director Division of Federal Assistance Vermont State Dept. of Education Montpelier, VT 05602

U.S. DEPARTMENT OF EDUCATION TECHNOLOGY CONTRACTS

Contact: Frank Withrow

	CONTRACT	GRANTEE
1.	Utilization of Technology in the Development of Basic Skills Instruction: Mathematics (October 1980-September 1983)	Ohio State University Columbus, Ohio 43210
2.	Utilization of Technology in the Development of Basic Skills Instruction: Reading (October 1980 - September 1983)	WICAT, Inc. Orem, UT 84057
4.	Facilitation of Development and Exchange of Computer Courseware Among Educational Agencies (October 1982 - September 1984)	Education TURNKEY, Inc. Falls Church, VA
5.	Needs and Development Opportunities for Educational Computer Software: Reading and Writing	The American Institute for Research (AIR) Washington, D.C. 20007
6.	Needs and Development Opportunities for Educational Computer Software: Math and Science	Technical Education Research Centers (TERC) Cambridge, MA 02138
7.	Needs and Development Opportunities for Educational Computer Software: Foreign Languages	University of Iowa Iowa City, IA 52242
8.	Computer Literacy Survey in Elementary and Secondary Education	Educational Testing Service (ETS) Princeton, NJ
9.	World of Work	Technivision Falls Church, VA

Department of Education, Division of Educational Technology

INSTRUCTIONAL TELEVISION SERIES

	TITLE	PRODUCER(S)
1.	Moving Right Along	WQED-TV Pittsburgh Scholastic Magazines, Inc. Educational Testing Services
2.	Tales in a Golden Groove	The Rainbow Television Works Los Angeles, CA
3.	Somebody Else's Place	Southwest Center for Educational (Television (SCET) Austin, TX
4.	Powerhouse	Educational Film Center Annandale, VA
5.	A Legacy Unfolded	Perspectives International, Inc. Washington, D.C.
6.	Multicultural Children's TV	Far West Laboratory for Educational Research and Development San Francisco, CA
7.	Rainbow Movie of the Week	The Rainbow Television Works Los Angeles, CA
8.	Villa Allegre	Bilingual Children's Television (BCTV) Oakland, CA
9.	K-I-D-S	Council for Positive Images Los Angeles, CA
10.	Spaces	Greater Washington Educational Telecommunications Association, Inc. (WETA-TV) Arlington, VA

11. 3-2-1 Contact	Children's Television Workshop New York, NY 10023
12. Y.E.S., Inc. (formerly Coming Together)	KCET Community Television Los Angeles, CA
13. Voyage of the Mimi	Bank Street College of Education New York, NY

STATE EDUCATION AGENCIES AND THE NEW TECHNOLOGIES

OCTOBER 27, 1982

TELECONFERENCE

Objectives

This 30-minute videotape segment of the October 27, 1982 teleconference addresses the State Education Agency's (SEA) role in organizing technical assistance, information dissemination, training, and other activities designed to introduce communications technologies into the schools. It is intended to:

- enhance knowledge of what SEAs can do to expand their staff's technology capabilities; and
- demonstrate that the SEA can play an important role in building LEA capacity to handle technology.

Users of the Videotape

This videotape is appropriate for administrators in SEAs who have responsibility for planning SEA use of technology or who are involved in encouraging the expanded use of technology in the schools. Administrators of intermediate school districts and large local districts also may be interested in viewing this tape.

Content

The videotape presents a panel of state government personnel discussing what their State Education Agencies are doing in educational technology. The discussion centers on three major topics:

- where the responsibility for technology planning and direction is situated within the SEA;
- how the SEA is using technology internally and modeling its use for local education agencies (LEAs); and
- services SEAs can provide to help LEAs learn to use the new technologies.

The panel is moderated by Virginia Robinson, editor and publisher of *Education Times*. Participants are Robert Allen, Director of the Information and Computer Services Division of the State of Georgia; Jolly Ann Davidson, a member of the Iowa State Board of Education and chairperson of the State Educational Radio and Television Facilities Board; James Phelps, the Associate Superintendent for the Bureau of Elementary Education in the Michigan Department of Education; and Robert Scanlon, then Secretary of Education in Pennsylvania.

Panel members discuss how the SEA can provide appropriate leadership when field-based experience with computers in education is limited and the old view of the need for a centralized control of all computer functions is being questioned. They agree that the appropriate role for the SEA is to facilitate the learning process for both SEA and local personnel. Appropriate SEA-level activities include sponsoring laboratories and workshops for SEA personnel, serving as a software clearinghouse and mechanism for disseminating public domain software, and providing training materials for preservice and inservice programs to prepare teachers to work with technology.

Modeling effective use is stressed as an important method for developing LEA experience with technology. Electronic mail, public television, and video teleconferencing are examples of using technology to transmit information. Effective management of technology is achieved through interagency task forces and other cooperative approaches to planning.

Pre-Viewing Activities

An issue paper entitled "State Education Agencies and the New Information Technologies" was prepared to accompany the panel discussion. A reproduceable copy of the paper is included in this packet. The paper outlines issues SEAs are facing as they begin to use the newer information technologies and to help LEAs use them; it also describes actions SEAs are taking to ensure effective use of the technology. You may want to distribute the paper and ask participants to read it before coming to the session. You may ask them also to consider what the agency could do to foster awareness of and comfort with technology within the organization and for teachers.

Post-Viewing Activities

After viewing the videotape you may want to discuss the following questions:

- What problems are we having in planning for and using the new information technologies? Are they similar to problems referenced in the videotape?
- Are any of the approaches described in the videotape appropriate to our needs and problems?
- What can our agency do to enhance the staff's comfort with technology and its ability to intelligently plan its use?
- What can we do to help schools and teachers who want to learn to use technology effectively?

Resources

For those who want more information about what SEAs are doing to organize for the new technologies, a bibliography is included in this packet. It may be reproduced and distributed with the above-referenced issue paper or after viewing the videotape.

Project

Basic
Education
Skills through
Technology

READING • WRITING • MATHEMATICS
LANGUAGE ARTS

ISSUE PAPER
PLEASE READ PRIOR TO
OCTOBER 27, 1982
TELECONFERENCE

STATE EDUCATION AGENCIES

and the

NEW INFORMATION TECHNOLOGIES

by

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Associate Director
Project BEST

October 1, 1982

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Association for Educational Communications and Technology
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STATE EDUCATION AGENCIES

and the

NEW INFORMATION TECHNOLOGIES

Executive Summary

Something different is happening . . . in schools, in homes and businesses, and at state education agencies . . .

- A school superintendent in a small Western district needs a new budget projection for that evening's school board meeting. Within hours, a high school student, working with a microcomputer, develops the information for him.
- Block grant funds were distributed to schools recently in one southern state. Within two days $1 million was spent by local schools for microcomputers.
- State Board of Education members, in one State, each have a microcomputer and use them to communicate with each other between board meetings.
- Parents, PTAs, local businesses are buying microcomputers and giving them to schools. Principals and teachers, too, are using local funds to purchase these new tools for their schools and classrooms. School officials in one suburban school district realized that this unexpected and uncontrolled growth would soon result in a plethora of brands with differing training, maintenance, and software needs. With no funds for equipment available at the district level, they determined that their role should be to provide guidance to those who do purchase it. To strengthen this advice, maintenance and training support is provided only to schools that follow their guidelines.
- A Midwestern state education agency, faced with reduced budgets, staff cutbacks, and the demand from schools for new services (related to microcomputers), provides a range of new support services at no cost to the agency's budget.Staff representing all branches of the SEA--instruction, vocational education, data processing, research, special education--have voluntarily formed an internal Microcomputer Committee. Each member of the committee works with microcomputer-using educator groups in one region of the state. They support local group meetings where ideas and problems are shared and hold computer problem-solving contests for students. Ideas and concerns from the regional meetings are fed back to the committee at the state level. Two statewide workshops are held each year to address the identified instructional and administrative issues. In addition, the committee produces a newsletter about computers in education that has 8,000 subscribers within the state. Every six weeks the committee conducts an in-service session for the agency's own staff.

A new form of personal technology--the microcomputer--is beginning to appear in education. While its effects on students are not yet evident, the above instances demonstrate, that it is beginning to affect the *adults* who manage the educational process, Traditional roles, relationships and services are being questioned and re-designed.

This paper explores this situation from the viewpoint of a state education agency and is meant to serve as background to an exchange of information among states during a Project BEST teleconference on October 27, 1982. After a brief discussion about what is different about this new technology, this paper explores the reported effects of this technology on SEA operations and ways that these conditions are being addressed. The organizational concerns explored include:

- *placement of responsibility for these tools within the agency*. Do they belong with media, management services, or in a separate configuration?
- *use in the agency's own management*. Is the centralization of all data processing (once justified to avoid the duplication of large, costly equipment) still appropriate? How can training and support be provided to the agency's own staff so that their use of these management and instructional tools can serve as effective role models for the schools?
- *new services required for effective and efficient use in the schools*. What roles can a SEA play when there is little in the way of relevant experience or knowledge on which to rely?

The paper concludes with a description of some of the ways SEAs are responding to these issues. This section will be expanded, after the teleconference, to include the specific workable ideas provided during the teleconference by the 41 states participating in Project BEST. Several questions are posed at the end of this paper to provide a bridge to each state's consideration of its own organizational concerns.

ACKNOWLEDGMENT

The development of this Project BEST issue paper has evolved over the past several months through a careful review of relevant documents and a series of collective and individual discussions among Project BEST staff, outside resource people, and members of the 41 SEAs in Project BEST. We are particularly indebted to those members of the project Advisory Board who offered to review the document.

STATE EDUCATION AGENCIES
and the
NEW INFORMATION TECHNOLOGIES

Project BEST (Basic Educational Skills through Technology) is designed to improve school-based instruction and learning of the basic skills. Why, then, will the first of its four national video teleconferences deal with organizational concerns at the state education agency (SEA)?

- Are there really issues that need to be discussed now?
- Is something different about the new information technologies (microcomputers, telecommunications) compared to previous technological innovations?
- What is the connection between how an SEA is organized and what happens in schools?
- What unique functional role can the SEA perform?

This paper suggests answers to these questions, outlines organizational issues and concerns related to the new technologies that are reported by the SEA participants in Project BEST, and provides a framework for understanding these specific concerns and SEA responses. A caveat is needed, however. Our perspective is limited. The readers and the writer of this paper are participants in (rather than objective observers of) the situations we describe. Moreover, we all seek to understand a situation in its early evolutionary stages--a situation that is also affecting the world around us. These new technologies, the microcomputer in particular, are having visible impacts on institutions other than education (e.g., business, home) and future development of the technologies well may be influenced more by these other uses.

Why an organizational concern, now?

With these significant constraints on our perception, why spend time now trying to understand what is happening? After all, not all SEAs have had to deal with these issues yet. Some may never have to, and it may be too early to see all the dimensions of the issues since some aspects may surface only after SEAs start to deal with them. The answer seems clear to us. Our generation of educational practitioners controls what happens next. The small steps we take may not appear to be related to the "futures" that are desired or promised, but they can have a unique influence on that future. This paper and the subsequent teleconference, therefore, look at actions that are practical today--in particular those actions an SEA can take at this time and within the limits of its own authority and resources. Our focus, therefore, is on the arena the SEA most directly controls--itself.

The SEA, as an organization, can be defined in many valid ways. To keep the focus on the practical aspects of SEA management, we are defining the organization as the people who work at or for the SEA and the formal and informal relationships that connect them to each other and to the purposes of their daily activities.

There are new challenges today. Faced with shrinking budgets and reduced staff, many SEAs are aware of the calls for a "re-structuring" of the state education agency, as well as schools, to meet the challenges of a modern technological society. Demands for change are not a new phenomenon in education, however. Periodically new ideas, techniques, or other potential improvements in the educational process have been advocated. Because the schooling process is built on a network of individual practitioners whose jobs and roles are somewhat interdependent, changes in one component invariably require modifications in others. The advocates of these changes, therefore, have spent a great deal of energy trying to get these others to modify their traditional behavior to accommodate the new ideas. They raise the spectre of the collapse of the institution, they portray children unable to cope with real world responsibilities, they use words like "outmoded," "irrelevant," "traditional," and call for "comprehensive change."

These images and demands for schools and SEAs to change traditional purposes and relationships are appearing again today in the professional and lay press in articles about the new "technology revolution." The first question we must address, therefore, is whether the conditions accompanying the introduction and use of the microcomputer and telecommunications technologies in education are just another example of the demand-for-change process at work--or is something really different this time?

What may be different?

Four areas appear to be clearly different from what has gone before:

- the technologies themselves,
- related events in the society outside the school,
- the depth of the knowledge base available for introducing and using the technologies, and
- how they are being introduced into the schooling process.

1. The Technologies. Different technologies no longer appear discrete. The "edges" are blurring as a result of the microelectronic revolution. For example, the same piece of equipment can serve as a word processor, teaching machine, electronic mail source, data processor, and television display screen. Or the same cable or channel can be used to carry any of the above. The old idea that media and technologies could be categorized as "instructional" or "administrative" is no longer valid. Today we are dealing with technologies that can be applied to both management and instruction (and perhaps cannot be applied efficiently unless they are used for both purposes).

Another important difference is that these new technologies, because of miniaturization and mass production techniques, are becoming smaller, less expensive, and easier for the non-expert to work with. This affects two critical dimensions of technology use--control and access.

Control is not an issue related to the "on-off" switch as much as it is one of whose problems the technology is helping to resolve. Individual administrators and teachers are paid to control the environment in which learning can take place. They cope with a steady flow of conditions and concerns that occur daily, weekly, and monthly. Many times in the past new technologies have introduced additional problems to this environment instead of aiding in its management and control. For example, within this environment the responsive administrator or teacher tries to modify available resources (e.g., time, space, materials) to respond to the changing needs of students as well as teachers. This ongoing problem-solving process cannot be separated from what we normally think of as instruction. It has a major influence on the quality of instruction--first, because it takes up a significant amount of time of those who deliver the instruction, and second, because it allows for creative responses, thus providing a potential source of job satisfaction. Many past attempts to apply technology to educational problems have impacted negatively on some element of this "real-time" instructional management process. We had inflexible schedules, curriculum materials that could not be modified easily, and in the case of administrators, data analyses and summaries that could be generated only once a quarter. All these were perceived as negatively affecting the teacher's or administrator's ability to control the overall situation for which s/he was responsible, regardless of the intrinsic value of the technology-supported curriculum materials for their intended audience in the classroom.

Today the lower costs, smaller size, and relative ease of use make new technologies such as the microcomputer attractive to the teacher and the building administrator. These educators, like their business counterparts, perceive possible applications to the current problems that impede their own effectiveness.

Access is of course a critical factor in whether one uses some form of technology to accomplish a task. Are the results worth the time and effort required? This question is posed by administrators deciding whether it is worth going to another floor to use a conference phone, teachers determining whether they should go to another room to use an audiovisual device, or any of us deciding whether to drive to work or take a bus. Again, the size and cost of the newer technologies allow them to be located in the workplace (classroom or office) and thus increase the likelihood that they can be used to deal with problems at hand without undue effort or loss of time.

2. Public Understanding and Support. Past attempts to introduce technology into the schools have had to deal with underlying resistance from the public upon which the schools depend for support and whose values they reflect. The school is the one social institution with which practically everyone has had experience. As a columnist noted recently, "We are almost all veterans or victims of the school system, connected by our childhood or our children." This common experience of schooling serves as the public's reference point when determining whether or how something new is "basic" to the process of education. Anything that does not fit can easily be perceived as a "frill."

What is different today is the very real possibility that these new information technologies will first gain acceptance as practical tools for personal communication and problem solving in the community. Their low cost, flexibility, and sophisticated marketing from one of the few "growth" industries in today's economy are making it possible for the public to gain independent experience with these tools. By the mid-80s microcomputers may appear in 10 percent of all U.S. households and be a primary work tool for about 25 percent of all jobs.[1].

Although the technologies may not have been around long enough to have immediate effect on the threshold of public experience, we are already seeing early consequences. Close to 20 percent of microcomputer purchases for schools are being made by PTAs.

> What is important about this rapid expansion of computer use in schools is that there is every reason to believe that computers will become a part of the core technology of schooling, with the broad and insistent support of middle and upper-middle class parents in every nook and cranny of the land. No parent of the 50s ever felt that his or her children would badly damage their career opportunities if they failed to master the 8-mm loop projector. They did not send their kids to TV camp, or buy them home language laboratories. Something different is happening here.[2]

3. Knowledge/Experience Base. No one wants to make a wrong decision! The greater the potential consequences of a decision, the more one looks for assurance that it is the correct choice. As part of the

search for assurance, one attempts to demonstrate that the decision reflects what is known--that it derives from a sound base of information or knowledge.

What is different today is that we have more information than knowledge. (Information is an educated guess untested by the results of actual decisions. Knowledge is information tested by experience. The experience that transforms information into experience can be one's *own*, that of someone *believed* because of his/her *repeated* experience (e.g., research), or that of someone *trusted* because of subjective factors.[3]) Educational leaders are now being asked to make decisions related to the new technologies in areas where they and most others lack the personal experiences that convert information into knowledge. Even those who have worked with "audiovisual and instructional technology find that the interactive technologies of today...are from another family of systems and approaches to system use."[4] Thus we have few "authorities" today, only some people with more experience than others. To cope with this, grassroots computer-user clubs, newsletters and magazines have prospered as ways to exchange and build on this experience.

4. *Introduction into the Schools*. To the extent that "introduction" means systematic activity planned by those at the top, the technologies we are talking about--primarily microcomputers and telecommunications--are not being "introduced" into education. First, we have not had the time or resources to develop the knowledge or experience on which to base large-scale plans. Second, the technologies are not remaining static; their features change and capacities improve almost monthly. Because of the control and accessibility features, the technologies are usually coming into education "at the bottom"--in the classrooms and in the offices of middle managers. To a great extent these users are applying them to *their* concerns, gaining practical experience thereby, and then discovering additional uses.*

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*Historians might note that the major characteristic of a real *revolution* is that it starts at the bottom so that by the time formal leadership develops, a solid base of commonly-felt need and support has been built.

This "grassroots" development process is in sharp contrast to previous more systematic attempts to bring technology into education from the top down (i.e., plan first, develop the materials, buy the equipment, and then train the teachers). Several local districts have reported interesting effects when the two processes "meet." Just as classroom teachers have students who know more about computers than they do, central administrators, curriculum and media specialists are finding building personnel with greater experience with the new technologies than they have. "Teacher participation in planning" may have been a goal in the past. Today it is a necessity.

What Is Needed and Why Should SEAs be Concerned?

If we accept the above indications that something different may be happening with technology in and around the schools, we must still ask why this should now concern an SEA. Are there needs that are different, and is the SEA the most appropriate organizational entity to meet them? (Assuming we were all born before 1958, we may find these "needs" by exploring briefly our own feelings when we think about using technology in our own work.)

Most of us are missing the hands-on experience of using these technologies to address some of the operational problems we face each day. This is both a training and organizational issue. We need to know how to use these tools, and we also need to have opportunities (once we know how to use them) to "mess-around," to experiment, to try them in different situations or with different problems. In other words, we need opportunities to think about and integrate the technologies into our problem-solving processes--to develop a sense of what we can do with them. If we do not discover, ourselves, what can be accomplished with these new tools, there is a higher probability that they will be applied only to reach the "old," more limited objectives we are already achieving without them. Much like architects in the years immediately following the invention of the elevator, we might be putting elevators in two-and three-story buildings.

We are also missing a sense of the consequences of the use of these new technologies. We have all heard the old saw that "teachers teach the way that they were taught." Most of us also manage the way we have been managed (and even parent the way we have been parented). The point is that our experience at the receiving end of these processes is an important influence on the way we later apply them ourselves and is qualitatively different from the experience of learning how to teach, manage, or parent in an instructional situation.

Thus we have a major need today for opportunities to experience the consequences of the functional use of the new information technologies by others. For example, we need to:

- learn job-related skills or information via these technologies;
- be part of work groups in which supervisors use technology functionally to support their communication with us and the decision-making processes that affect us;
- receive benefits and services that might not be available if technology were not being used (for example, access to peers dealing with a similar problem, more time for analysis of information, support at the time it is needed).

At the present time we have few opportunities in the educational organizations in which we work, or to which we relate, to gain these types of experience.

Finally, one of the most pressing needs today, given the depth and nature of the "knowledge-base," is for the sharing of experiences. The phenomenal growth of educational microcomputer user newsletters, magazines, clubs, and networks attests to the primary need that educators have to stay current in this fast-developing field. The universal problem, however, is ascertaining who has relevant experience and gaining access to it while it is relatively current, without undue cost or burden.

What Could SEAs Do?

"Because needs exist" is not per se proof that an SEA is the most appropriate organizational entity to respond to them. SEA roles vary from state to state, and in many places "legislatures expect SEAs to serve as bureaucracies for the enforcement or enablement of minimum standards for school operations" rather than as "general-purpose, broad-band" educational improvement agencies.[5/] Therefore we cannot deal here with the issue of whether an SEA should respond to these needs, only to what it could do. What responses are needed and what advantages would accrue to the SEA that provides them?

The various responses to the current information needs discussed above include these:

- The SEA can provide opportunities and mechanisms to facilitate experience sharing--for example, human resource directories, newsletters, materials exchanges, meetings, and referral services.
- The SEA can provide hands-on experience with the new technologies, directly or through the support of training in other institutions.
- The SEA can provide opportunities to experience the effects and consequences of regular technology use by making effective use of it in its own work.

Experience Sharing. Like other professionals, educators want to stay current, exchange solutions to common (and uncommon) problems, and continue to learn. These goals are usually met most effectively through face-to-face interaction at meetings and conferences. More formal support mechanisms to accomplish these purposes have been attempted (e.g., national clearinghouses that gather, index, and make available print materials, also dissemination systems to distribute packaged curriculum materials) but they have been largely unsuccessful in meeting the needs for interactive exchange of ideas at the times they are needed.

This type of support that can provide relevant information on a timely basis requires an external agency that has an established organizational relationship with the schools. It must be distant enough to ensure access to a sufficient and broad base of experiences, yet close enough so that those who request information can feel they are dealing with someone who "understands" their situation. It must also be able to maintain a steady two-way flow of information. Interestingly, the problems in facilitating experience sharing are less those of getting the information "out," and more of identifying and getting it "in." That is, to be close enough to daily practice to know who is doing what (or to know who does know), and to have regular, nonburdensome ways to document and gather the information. Finally, the effective information broker must be trusted and perceived as non-threatening No surer barrier to information exchange exists than the perception that expression of a need for information makes you look less than competent, or will be used against you, or that someone else will take credit for your ideas.

For several reasons the SEA can be a suitable vehicle for the information brokering that is needed. As a permanent organization established under state laws, it has continuing relationships with those who want experiential information and those who have it--the schools in its state. It has established reporting and communication channels and is usually close enough, geographically, to be accessible and responsive to requests.

The need for this neutral brokering role between schools that have experience and those without it offers the SEA an opportunity to address what some have termed their leadership dilemma. "It is difficult," one state administrator noted, "to lead the parade when some people in the parade are afraid you'll take them down the wrong road." Local educators mistrust state educators just as those at the state level mistrust the "feds." Each rightly questions the capability of the higher level to understand fully its situation and see what is needed. Conflict occurs when that next higher level assumes that it does know as much about a situation as those who are part of it. The present knowledge situation regarding these new technologies (in which there are no authorities) offers the SEA an opportunity to play a needed facilitating role, one that acknowledges the value of local experience.

Experience with the technologies. As noted earlier, this need has two dimensions. Educational practitioners in teaching, supervision, and administration need to experience both "ends" of technology usage: (1) as a problem-solving tool for their own use, and (2) its effects and consequences when used by others.

The staffs of SEAs and LEAs both need the first type of assistance, but the SEA's responsibility and resources, in most cases, do not extend beyond providing that type of practical experience for its own staff. This type of learning requires more than a hands-on workshop. Time is needed to provide opportunites to experiment, test the technology's potentials, and adapt its features to individual needs. In the second situation, however, we have a critical need now for an external agency that has regular interactions with LEAs to provide a functional model. Model, in this case, does not mean demonstration of correct use. Instead, what needs to be modeled is the process of educational practitioners working through the issues and problems encountered as they attempt to improve their efficiency and effectiveness by using the new information technologies. Using these technologies within the SEA, and especially as part of its interactions with the schools, could give local educators opportunities to learn personally about the capabilities of tools they may soon consider for local use. To the extent that an SEA can begin to use microcomputers and telecommunications as functional management tools, confront the organizational issues that will be spawned, and share its learnings with the schools, the SEA can uniquely impact the future use of technology in local schools.

What Issues Must Be Addressed?

So far in this introduction to the October 27 teleconference, we have attempted to describe the factors that indicate the new information technologies carry with them larger cross-cutting implications for SEA roles, operations, and eventual technology use in the schools. These implications have an experiential base. In their feedback to us the SEA teams that are part of Project BEST are describing the issues they are confronting and telling us how they deal with them. States are at various stages in their awareness and actual use of microcomputers and telecommunications technologies. Nevertheless, the reported concerns* at this early stage of technology use seem to group themselves in three areas:

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*Interestingly, the problems and organizational tensions that business and industry are experiencing as microcomputers are introduced are largely the same as those being reported by the SEAs. (See "The Fortune 500 Microcomputers," Popular Computing, September 1982.)

1. boundaries, authority, and relationships
2. management uses within the SEA
3. services to the schools

This section presents the various dimensions of each of these issues and some of the ways that states are addressing them. Additional ideas will be exchanged as part of the October 27 teleconference activities. We address only microcomputer-related issues here because that is currently "where the shoe hurts!" The issues are much the same for telecommunications, although they may currently be less intense.

Boundaries, Authority, and Relationships

Until now most SEAs have been able to define and keep largely separate their instructional services and administrative/management operations. Computer-related activities have been assigned mainly to the administrative/management area. Because large volumes of data are needed for accountability and reporting, these computer operations have involved large (mainframe) computers with all of the data going into it at one time (batch processing) and with fixed reports whose elements had previously been determined. Moreover, most of an agency's data processing has been centralized to avoid wasteful duplication of equipment and special personnel.

The microcomputer, with its low cost and potential for more individualized input and interactive reporting, has wreaked havoc on old definitions of centralization and decentralization, and on the organizational separations that went with them. Within any one SEA, it is possible to find those who view the micro as an instructional tool because it is used in schools; others who see it as a valuable resource for the planning and service delivery needs of the agency's own middle managers; and still others who see it as a peripheral extension of the agency's main computing resources. These multiple views can naturally create some tension. Among the issues of concern are:

- who will control purchases of microcomputers
- who determines who gets them and how they will be used
- how to maintain standards and cost controls

- who provides training and software support
- where word-processing fits in
- whose office gets the electronic mail access terminal?

Some states are experiencing directly the effects of not having answers to these questions. For example, in one state where agency management and instructional services were seen as totally separate functions of the SEA, a contract was let to an outside group to address the agency's word processing (office automation) needs. The subsequent study, therefore, did not recognize that the terminals to be placed around the agency could also be used to access and manipulate a variety of data and resource files that the department maintained for the support of middle management (such as health records, federal nutrition reporting requirements, and the tracking of private school placements in special education).

Many of the states facing these issues are using some form of interdivisional committee, workgroup, or task force to open communication, acknowledge the separate interests involved, and promote more productive relationships. In placing the responsibility for microcomputers in an appropriate niche, a range of approaches appears. Some agencies assign responsibility to instructional media, others to data processing or management information systems departments. At least one state has determined that technology is too important to be put in any one division, thus has placed it under a Technology Executive Committee chaired personally by the chief state school officer.

In many states the original responsibility for microcomputers may be fortuitous, i.e., it is assumed by the person who is interested. Size of the agency also influences responsibility. Larger SEAs have less trouble assigning responsibility to full-time staff and therefore may have more difficulty if they want to diffuse responsibility for microcomputer use throughout the agency. Conversely, the smaller SEA may find it easier to spread responsibility across divisions and avoid specializing.

Management Uses within the SEA

These functional issues appear to center on two concerns--how to get started, and how to provide SEA staff with appropriate experience and support.

One would anticipate that getting started, in light of the fiscal conditions in most states today, might be an impossible task. It is surprising, therefore, to find how much is being done. This may be because it is usually easier to understand (and sell) the uses of technology for management and administrative purposes than for instruction. The payoffs are more obvious and immediate, and the boards and publics that support the SEAs have more experience in these areas. Thus in some cases microcomputers are coming in on the "coattails" of improvements in agency clerical efficiency (word processing). In other situations, however, expenses have been justified by starting with a practical management problem that clearly demonstrates the technology's value. For example, one state employed nine people to log, by hand, school bus mileage reimbursement data. They were 2-1/2 years behind. The activity is now performed by two people using microcomputers and they are only two months behind.

Some states are beginning with rational, systematic planning approaches. One state superintendent, for example, announced that no microcomputers could be purchased with state funds until the state had a microcomputer policy. Others are starting with explorations of goals, objectives, roles, and functions before moving ahead. On the other hand, some are proceeding to develop understanding and experience before they begin systematic planning. These states appear to be bringing people within the agency together in looser organizational frameworks to look at mutual needs and interests and to develop attitudes and support from within.

To develop the range of experiences that SEA staff require--from awareness through the ability to use the technologies as functional management tools--many states are starting with staff development workshops. Some provide separate training for clerical staff. For the continuing support that is needed, one state has created a staff computer lab. It houses all the technologies accessible at the SEA and two full-time professional staff members. SEA staff can use the facility at any time to get formal or informal assistance or just to try out their own ideas.

Services to the Schools

We have described a number of internal issues being addressed by SEAs, but the agencies' major concern still lies with their services to schools. In this area they are dealing with two issues--identifying needed services associated with the use of microcomputers in the schools, and determining the appropriate organizational format for providing those services.

Among the services being considered (and in many cases provided) are:

- Information and experience exchange--This includes human and material resource directories, consultant files, and computer user groups.
- Software evaluation/review--States perceive the need for a variety of services in this area. Central among them is helping schools deal with the proliferation of software vendors. Some SEAs have set up a central library where software developers can place their materials for review. This enables schools to examine a range of products, and permits developers to have their materials reviewed by potential users without fear of having them copied.

  Some SEAs are comparing their roles in software review to what they do with textbooks. Should there be an approved list of software, for example?

  Additional related services being offered or considered include:

  -- serving as a clearinghouse within the state for locally-developed software

  -- establishing standards for software

  -- reviewing software through curriculum committees.

- Hardware evaluation and purchase--Among the needs and services being identified by the SEAs are:

  -- negotiation of state contracts with hardware manufacturers to assure discounts for local school purchases

  -- evaluation and approval of brands and types of equipment

  -- provision of funds for purchases; several states are considering or using block grant funds for this purpose; in one, $1 million has been set aside for mini-grants to teachers ($4,000 each)

  -- establishment of centers where all approved brands of equipment are available for those who wish to test them.

- Curriculum development--Almost all states have recognized the need in the field for some direction in terms of the over-used term "computer literacy." Some are conducting formal and informal surveys and literature reviews to determine how others define and deal with it. Some have established committees to develop their own definitions and their own materials. In at least one state the computer literacy curriculum and materials developed by the SEA are being distributed out-of-state through a commercial publisher with the state receiving a 10 percent royalty.

- Training--Many states have been involved in direct training or the support of training through other agencies (i.e., colleges, intermediate units). Some states are considering a computer literacy requirement for teacher certification.
- Awareness activities--Because of the interest being expressed by local schools, most SEAs are providing some form of support for general awareness activities. This takes the form of teacher and/or administrator conferences, special publications, and in at least one case, the development of a set of videotapes showing uses of the microcomputer and how to plan for their use. These are being distributed commercially outside the state.

The organizational formats that are in use or being explored include:

- support for a separate agency (e.g., MECC)
- placement of the responsibilities in intermediate service agencies
- establishment of a special office within the SEA
- provision of a staff expert in each major instructional area
- use of outside consultants.

Summary

This background paper began by questioning why a national project whose overall goals address the content of instruction (specifically the teaching of basic skills) should devote its first video teleconference to the process--that is, how people organize and relate to one another to deliver instruction. Our answers suggest that at this early point in understanding the relationship of information technologies to education, the content and process issues are almost inseparable. The medium affects the message and vice versa.

We have also added a third element to the content and process mix: people who have to deal with the related content and process issues while they are still learning about them. When the future of technology in education is discussed, one usually hears of two interrelated concerns--hardware and software. We are focusing on a third--"peopleware." The first two will be continuing concerns for some time and are currently locked into a "chicken or egg" situation. Some leaders say, "Start with software--there can be no effective school involvement until the quality of the software improves." Others say, "Start with hardware--one computer per school or even per classroom is insufficient. Provide enough hardware and the software will follow--some of it developed by the teachers and students themselves."

Regardless of the outcome of that debate, the third area--people--is, in practical terms, all there is. People exist--in SEAs, on state boards of education, in intermediate service agencies, and in LEA administrative offices, school buildings, and classrooms. Nothing new has to be developed. They already have the "required software"--a concern for the improvement of teaching and learning in the basic skills and derivative questions about how the new information technologies relate. They do not have all the answers to those questions or access to the information and experience from which answers can be derived. This is the situation that Project BEST addresses through its teleconferences and other information services. It is providing connections for these people to find answers for their present concerns and to help education find longer-range answers for tomorrow's.

The October 27 Project BEST teleconference reflects our belief that solutions do not have to wait for a complete understanding of the issues. Solutions and understanding can proceed concurrently. This October teleconference and related state activities are designed to start a process of developing mutual understanding among those who are dealing or may soon have to deal with the implications.

This issue paper will be expanded after the teleconference to include the issues and ideas exchanged by the states. To stimulate that discussion and add more specific content to the revision of this paper, please consider the following questions:

- Are the issues outlined in this paper concerns in your state agency? Are there other issues related to the new technologies that are equally important?
- How are these issues being addressed? What are the strengths and weaknesses of your approaches? What would you do differently?

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SCHOOL-INDUSTRY COOPERATION AND HIGH TECH--THE FEELING IS MUTUAL

JANUARY 24, 1983

PROJECT BEST TELECONFERENCE

Objectives

This 50-minute segment of the January 24, 1983 videotape teleconference is designed to:

- create interest in cooperative working relationships between schools and high-tech industry;
- enhance knowledge of what the private sector can offer the schools; and
- provide information on how schools can approach the private sector for assistance.

Users of the Videotape

This videotape is useful to district administrators and school personnel who are developing proposals or who are considering other attempts to involve the private sector in the school system. It offers ideas on how to approach the private sector and what types of companies can help.

Content

The videotape includes a 10-minute segment of comments from educators who have experience working with the private sector and a 40-minute question-and-answer session with representatives of high-tech industries. The interview clips provide an overview of districts' experiences in cooperative working relationships and summarize what has been learned about establishing such relationships. The question-and-answer segment addresses many of the concerns most frequently voiced by educators.

Educators shown in the interview clips represent five very different communities: Fairfax County, Virginia; Plains, Montana; Cincinnati, Ohio; Albany, Ohio; and Ann Arbor, Michigan. The panel of experts represents firms in high-technology industries. Panel members were: Chris Bowman, formerly National Manager of Educational Marketing at Atari Computers, now with Apple Computers; Dr. Pauline Jordan, Corporate Manager for Learning Technologies at General Electric; Michael Odom, from Digital Equipment Corporation, who is on loan to two school systems in Massachusetts; and Glen Polin, Manager of Educational Market Development for Apple Computers.

The educators and the representatives of high tech industries agree that the private sector can be broadly defined to include local "high-tech" businesses, employers who hire technology-oriented personnel, parents knowledgeable about technology, and volunteers in the community. They indicate that private support should be broadly defined to include assistance with staff training, curriculum development, classroom instruction, and hardware/software selection, as well as donations of hardware and software. Specific suggestions are offered for identifying potential firms and approaching them for help.

Pre-Viewing Activities

A short paper entitled "Schools and the New Information Technology: Fostering Public-Private Sector Cooperation" is provided with this packet. It describes the experiences of several school districts that have worked with the private sector and impediments to public-private cooperation. Copies of this paper may be reproduced and distributed to participants with the invitation to view the videotape. This will allow viewers to read the paper and focus on the topic of public-private cooperation before the meeting.

Post-Viewing Activities

You may want to lead a discussion after the videotape has been shown. Possible agendas include the following:

- Invite speakers from your district or neighboring districts to talk about cooperative projects they have with the private sector.
- Invite speakers from private industry who have a history of working in the schools or who have expressed interest in developing a cooperative relationship to discuss their experiences.
- Conduct a brainstorming session to generate ideas on:
    - how your district could use help from the private sector;
    - firms you could approach; and
    - benefits to the schools and to the company from developing cooperative relationships.

Resources

A background paper on public-private cooperation in the schools (Schools and the New Information Technology: Fostering Public-Private Sector Cooperation) is included in this packet. It contains a bibliography for those interested in additional reading.

SCHOOLS AND THE NEW INFORMATION TECHNOLOGY: FOSTERING PUBLIC-PRIVATE SECTOR COOPERATION

Prepared by:

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January 1983

INTRODUCTION

Several factors contribute to the current interest in exploring public/private sector cooperative arrangements in using of technology, such as the microcomputer, in schools. First, federal funds for educational programs are not as readily available as they were 10 years ago. Thus, school systems are forced to consider other sources of funding for projects and special programs that cannot be defrayed out of regular operating budgets. Second, declining test scores on national achievement tests, high student drop-out rates (particularly in inner city schools), and conditions that some are describing as low student motivation and lack of discipline have become a concern for parents, teachers, school administrators, and employers. They search for alternative approaches that might improve student learning and motivation. Technology and career education are possible solutions-- technology because of its perceived powers to motivate and teach and its growing prevalence in the society, and career education because of its emphasis on training students, while still in school, about the expectations of employers and about the skills they need to find and to hold jobs. Finally, businesses are finding that high school graduates (and sometimes even college graduates) lack the basic math, reading, and communications skills needed to succeed in the world of work. One solution is to become involved in the school system to ensure that future graduates are better prepared for employment.

Examples of how the private sector can become involved in supporting the educational system have been documented:

- The Boston Compact is a cooperative agreement between the Boston public schools and local businesses in which the school system has agreed to improve the quality of its graduates and local industry has agreed to employ them. The school system has accepted a variety of administrative reforms designed to improve accountability and upgrade classroom teaching; in return, the Private Industry Council is supplying coordinators who link students to employers for part-time work while in school and for full-time employment after graduation (Peirce, p. 7).

- In Washington, D.C., the school system is working with national and local businesses to create several career-oriented high schools in fields such as communications, finance, and information science. Private industry donated materials and executive time to create the course. Again, the intent is to foster good work habits and to help students develop contacts with employers that may lead to permanent positions after graduation (Rosenau, pp. 6-7).

- Oxford, Massachusetts, has developed a partnership with the Digital Equipment Corporation, a high technology firm that develops computer hardware. One element of the relationship is Project COFFEE, which features a hands-on experience for adolescents who have a history of school failure. The project offers training in a combination of basic skills and occupational skills in high-technology fields. Digital has helped Oxford schools in other ways also, including teacher training and retraining for teachers who lost their jobs (Rosenau, p. 6).

- Indianapolis has initiated Partners in Educaton (PIE) as a cooperative effort of the city schools and the Chamber of Commerce. This project matches schools with one or more employers on renewable one-year contracts. It brings business people into the schools to work with teachers and students and brings students and teachers into business and industry. The intent is to assist each in learning the needs of the other and to help teachers and students prepare for the demands of industry (Gilbert, p. 9).

These examples suggest that business and industry can contribute to the educational system in various ways:

- They can provide instructional materials and special curricula for use in the classroom.
- They can offer resource people who can serve on advisory committees, speak to classes and at special programs, or teach selected units.
- Business and industry can provide work awareness and experience through tours of the plants, summer jobs, and part-time employment during the school year.
- Industry can provide equipment by donating it to the schools or by opening its own facilities to students during off hours.
- Private industry can make funds available to finance special projects or to purchase equipment.

DISCUSSION

The kinds of contributions listed above may support many different educational activities, including those involving the introduction of technologies, such as the computer, into the classroom. And local school districts are turning to private industry as a partner in introducing and using computers in schools. School systems maintain that with declining enrollments, limited budgets, and the limited availability of federal funding, private sector help in selecting and purchasing hardware, training teachers, and training students is welcomed.

Hardware manufacturers have responded by donating equipment, establishing foundations to award mini-grants, advocating Federal and state legislation for tax exemptions on business donations to schools, and offering computer training to teachers and administrators. Software manufacturers have established partnerships with school systems to pilot test courseware. Participation in planning and advisory committees, assistance in curriculum design, and offering technical assistance are other ways the private sector has responded.

Despite the interest in such cooperation, distrust, miscommunication, and failure to establish substantive cooperative efforts are still common. Indeed, current research (Useem, June 1982) concludes that "...for the most part school-industry ties are fragmentary, weak, and of short duration," and that "despite new interest in industrial-education partnerships, it is highly unlikely that corporations will be able to provide schools with the resources traditionally supplied by government funds" (Useem, June 1982, p. 1).

What are the barriers to building effective working relationships? The writings of Rosenau (November 1982) and studies by Useem (1981, 1982) on the relationship between high-technology industries and the schools in the Silicon Valley of California and along Route 128 in the Boston metropolitan area reveal some of the difficulties in achieving an effective partnership.

Dr. Useem cites the following obstacles to collaboration:

- The dynamism and rapid growth characteristic of new high-technology firms require that corporate resources be directed inward to foster new product development and growth rather than outward to the schools.

- Rapid growth fosters equally rapid organizational change, including mergers, spin-offs, and changes of assignment that make it difficult to establish ongoing working relationships and to build trust.

- Businesses tend to be short-term oriented, wanting to see immediate results from their investment. The long-term planning cycle of most school systems inhibits the development of mutually beneficial projects with tangible results that are visible in a relatively short time span.

- Industry's support of tax-cutting initiatives in both California and Massachusetts was perceived by educators as a negative position toward education that created distrust and animosity.

- Many business people feel frustrated when they try to figure out the school system and see where their input can actually make a visible difference. Consequently, they prefer to work with institutions of higher education or specific schools where results are more apparent and may have immediate pay-off for industry.

- Limited budgets make it difficult for school systems to assign personnel to maintain regular contact with industry.
- School officials maintain that industry is interested primarily in benefits to itself--when companies need personnel they establish ties to the schools and cut them again when labor shortages ease.
- Educators resent the low regard in which they are held by industry personnel. They believe business people consider educators poor administrators who allocate public funds inefficiently and wastefully; this is one reason, educators maintain, for industry's lack of support for increased public funds for education.

Despite these obstacles, there are more optimistic signs. Some of the older "technology" industries, including Hewlett-Packard, IBM, the Digital Equipment Corporation, and Bell & Howell, are cited as taking active, supportive roles in education. Also, liaisons based on personal contact and mutual interests do occur. For example, one of the schools visited by Project BEST recently received a contribution from a corporation to help build a computer lab. A student's parent works for the firm and was instrumental in obtaining the funds.

Floretta McKenzie, Superintendent of the Washington, D.C., public schools, maintains that establishing working relationships between the schools and private industry must involve benefits for both sides. She says:

> It's time for the managers of public resources to stop trying to pick corporate profits, and to start helping our private sector companies find cost-justified approaches to coupling business interests of their shareholders with the educational interest of young people (Rosenau, p. 6).

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PROJECT BEST VIDEO NEWSLETTER #2

May 17 - 18, 1983, Teleconference

This second video newsletter was broadcast on May 17. The newsletter is about 23 minutes long. It presents updates on publications, software, filmstrips, slides, videotapes, and other programs and activities dealing with computer literacy. It also includes upcoming Project BEST activities and proposed new informational resources for use by participating BEST states. The items in the newsletter have a suggested shelf-life of only 30 to 45 days. The attached Guide Sheet contains a listing of the key products, services, and activities announced in the newsletter. Because the program moves too quickly to copy down addresses and phone numbers, the attached listing of addresses and resources is an important complement to the video newsletter.

The diskettes demonstrated in the newsletter, offered through the ERIC Clearinghouse of Syracuse University, were mailed to each Project BEST State Team Leader under separate cover for use with the May 18 teleconference. Similar diskettes are being prepared by the ERIC clearinghouse on the topic of hardware and software evaluation.

Guide Sheet

Informational Products Announced
on May 18, 1983
Project BEST Video Newsletter

1. Diskettes (2) from ERIC Clearinghouse Selected Information Resources from RIE and CIJE on Computer Literacy	Produced (for BEST State Teams) by: Dr. Donald Ely, Director ERIC Clearinghouse on Information Resources Syracuse University School of Education Syracuse, NY 13210
2. BEST NET Bulletin Board (Beginning June 1, 1983) Software Information Exchange	Available to BEST NET electronic mail users on an experimental basis. Source: Mrs. Bobby Goodson Computer Using Educators Box 18547 San Jose, CA 95158
3. Videotape of teleconference from New York: "Computing Strategies for Success"	Carmen Paigo Center for Learning Technologies Media Network Cultural Education Center C-7 Albany, New York 12230 ($40)
4. Books from State of Tennessee Department of Education Computer Skills Next: A Plan for Grades 7 & 8 Microcomputers in the Schools: An Educator's Guide	Dr. George Malo, Director Division of Research and Development Tennessee Department of Education 135 Cordell Hull Building Nashville, TN 37219
5. Handbook from Santa Clara County Office of Education Computer Education Handbook	Bonnie Pardue Microcomputer Center Mail Code 237 Educational Development Center Santa Clara County Office of Education 100 Skyport Drive San Jose, CA 95115 ($25 + $5 shipping and handling)

6. Guide from Educational Software Evaluation Consortium 1983 Educational Software Preview Guide	Available to State Team Leaders--limit of one copy each upon request. Cheryl Petty Garnette Project BEST/AECT, Room 214 1126 Sixteenth Street, N.W. Washington, DC 20036 Other persons should contact: Kathy Parks TECC Clearinghouse, Software Library San Mateo County Office of Education 333 Main Street Redwood City, CA 94063
7. Book from the American Association for Higher Education Meeting Learners' Needs Through Telecommunications: A Directory and Guide to Programs	Marilyn Dressel, Director Center for Learning and Telecommunications One Dupont Circle NW, Suite 600 Washington, DC 20036 ($40 to non-members)
8. Book from Office of Technology Assessment, U.S. Congress Informational Technology and Impacts on American Education (includes case studies by Linda Roberts)	Superintendent of Documents U.S. Government Printing Office Washington, D.C. 20402 GPO #052-003-00888-2 ($8.00)
9. Videotapes from Project BEST (Available after June 30, 1982) "Teaching with Computers--What Can I Do!" "Computerwares: Hard & Soft Decisions"	Producer: Project BEST/AECT, Room 214 1126 Sixteenth Street, N.W. Washington, D.C. 20036
10. Guide from Project BEST (Available after June 30, 1983, to BEST State Teams) Users' Guide to Project BEST Products (Print and Non-Print)	Author: Project BEST/AECT, Room 214 1126 Sixteenth St., N.W. Washington, D.C. 20036

BECOMING LITERATE WITH THE NEW TECHNOLOGY

PROJECT BEST TELECONFERENCE #3

May 18, 1983

Objectives

This was the third in a series of four video satellite teleconferences undertaken by Project BEST. Entitled "Becoming Literate with the New Technology," the one-hour teleconference was transmitted on May 18, 1983.

The teleconference was designed to:

- clarify issues raised in the video module "Learning and Teaching ABOUT Computers," and
- provide viewers with an opportunity to query experts about their computer literacy concerns.

The teleconference focused on five issues in computer literacy:

1. What is it?
2. How do educators become computer literate?
3. Competencies, such as programming, that need to be addressed.
4. Support needed by staff beyond introductory computer literacy workshops.
5. Whether to integrate computer literacy into the curriculum or offer a separate course?

Users of the Videotape

This videotape is appropriate for SEA and school district administrators who have responsibility for planning and developing K-12 computer literacy programs. It can be used also in staff development programs to make teachers, administrators, and volunteers comfortable with using microcomputers in school settings.

Content

Clips from the 30-minute computer literacy video module transmitted earlier to the viewing sites were shown to focus panel discussion and call-in questions from viewing sites.

Members of the teleconference panel included Bobby Goodson, Computer Resource Teacher in Cupertino, California; Fran Gallagher, Program Analyst for Fairfax County Public Schools in Virginia; Marvin Veselka, Associate Commissioner for Professional Support, Texas Education Agency; and

Jenelle Leonard, Assistant Director of Computer Literacy for the District of Columbia Public School System.

Questions were received from more than 20 viewing sites, including places as far away as Puerto Rico, Alaska, and California. Illustrative topics and questions addressed during the teleconference were:

1. Differences in attitude and interests between boys and girls in computer literacy courses.
2. Evidence of the effects on thinking, logic, and reasoning skills of learning particular programming languages.
3. Have any states established computer literacy as a minimum competency required for graduation?
4. What types of instructors are states using to conduct computer literacy workshops?
5. What are states doing to teach computer literacy skills to administrators and managers?
6. Pros and cons of allowing teachers to take computers home for hands-on experience.
7. Involvement of parent groups in computer literacy school programs.

Pre-Viewing Activities

We recommend viewing the 30-minute video module "Learning and Teaching ABOUT Computers" before viewing the teleconference. The video module can be repeated several times and stopped at crucial points for discussion. The video module provides background information that will enhance learning from the teleconference.

Post-Viewing Activities

After viewing the videotape, you may want to discuss the following questions:

- How are we defining computer literacy and what competencies do we want students, teachers, and adminstrators to develop?
- How are teachers and administrators in this district learning about microcomputers and how can we help them?
- What are the students currently being taught? Is this what we want them to be learning?

Resources

For those who would like more information about the subject of computer literacy, a bibliography is included in this packet. It may be reproduced and distributed with the above referenced video module and teleconference videotape.

Selected Bibliography of Print and Non-Print Information Resources on Computer Literacy

Compiled by

Project BEST
Association for Educational Communications & Technology
1126 Sixteenth Street, NW - Room 214
Washington, DC 20036

May 18, 1983 Computer Literacy Teleconference

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OPPORTUNITIES TO LEARN

Project BEST was designed to provide SEA personnel with experience using the new information technologies and an opportunity to learn from that experience. Video teleconferencing, videotapes, audio teleconferencing, and electronic mail were the technologies demonstrated by the project.

The following paper, VIDEO As a Medium for Sharing Experience, discusses the Project BEST staff's insights about uses of video as an effective method of communicating. The paper presents our learnings about video teleconferencing and videotapes. It highlights why these media were selected and what producers need to consider when using these media.

A second paper on insights about audio teleconferencing and electronic mail will be developed if participating state teams express an interest in this activity. All comments about experiences with these media should be addressed to the Project BEST staff.

Project

Basic
Education
Skills through
Technology

READING • WRITING • MATHEMATICS
LANGUAGE ARTS

. . . Opportunities
to
LEARN

No. 1

VIDEO
as a Medium
for Sharing Experiences

Prepared by:

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VIDEO AS A MEDIUM FOR SHARING EXPERIENCE

> "...In addition to giving us a reason and opportunity to communicate with each other, we will also have an opportunity to learn about the potentials, effects, and consequences of these technologies we'll be using..."
>
> Project BEST orientation videotape, June 1982.

PURPOSE

Learning is an exciting process when our own experiences provide the information that feeds the process. Unfortunately, once we leave childhood we rely increasingly on information derived from other people's experiences (research, publications, etc.). Opportunities for direct experience with totally new situations become infrequent. In that sense one of the "fortunate" aspects of living through this early stage of the information technology revolution is that the research and previous experience do not exist. We have to give credence to our own feelings, judgements and perceptions.

One of Project BEST's purposes is to stimulate that personal process--to use the new technologies as tools in the conduct of project work, then to provide opportunities to reflect on that use and to see what can be learned from our own reactions. The intent of this paper is to trigger and expand that reflective process.

During this year we have systematically solicited and collected your feedback by phone, mail and electronic mail. We have also documented our own perceptions. These reactions have been an invaluable element of this process. They have allowed us to reflect on our original intentions and assumptions, as well as our actions, and to ask "why?". Our answers to that question are presented in this first "learnings" paper. We hope they prompt reactions and further exchange that will allow this process to better inform the future technology decisions each of us may be called upon to make.

INTRODUCTION

People are usually surprised when we tell them that Project BEST is not a "microcomputer" project, for most of the content of our communication deals with this revolutionary new technology. Our own view of the project's purpose is more accurately portrayed in our logo--"People-to- People: the BEST Approach." We are attempting to use information technologies to connect people who share similar concerns in ways that will facilitate their ability to solve their own problems. In January 1982, the project described its intentions as follows:

> As a dissemination project, Project BEST is in the business of communication--communicating about technology. As Drucker notes, real communication is not created by technology. Technology can only provide the links or structures that extend, enhance, and/or connect certain mutual needs to exchange information. Each of the project's uses of technology, therefore, will be determined within a broader context of the purposes of the two-way communication of which it is part....
>
> ...We will choose our media against the reference point of what we are trying to accomplish and communicate (about both the content and the medium we are using to communicate it). Our choices also will be functionally appropriate to the task in which the project and the states are engaged. Task-relating the technology is important to counteract the history of "technology demonstrations" where the participants' role is limited to observation or "playing" with the technology. Thus they possibly come away impressed, but with no personal experience that ties the technology to the real world conditions they face.
>
> ...We will provide functional experience with the new information communication technologies so that participants can experience the benefits and generalize them to their own situations.

We now have a year's experience using four technologies to address project communication needs:

- satellite telecasts for broad dissemination of materials and expertise;
- videotape to record current school experience with the new technologies;
- electronic mail for point-to-point exchange and access to current resource lists; and
- audio teleconferences for interaction, questioning, and idea exchange.

The subjects of this paper are the two video technologies. A second paper, to be distributed as part of the June, 1983 Project BEST teleconference, will address the more interactive technologies of electronic mail and audio conferencing.

The framework for presenting the information on each of the video technologies is:

- our intentions and assumptions;
- our observations of what occurred; and
- our reflections, generalizations and tentative learnings.

SATELLITE TELECONFERENCES: PRESENTATION OR COMMUNICATION?

1. Intentions

When Project BEST was being developed the thought was that the teleconferences would serve as work sessions involving project staff and state team members. The focus for the live communication exchange would be the video modules and other awareness/training materials that the project was developing for SEA use.

> The satellite video teleconference will serve as a meeting between the developers and users of the video materials. During the teleconference, contextual information will be presented about issues or principles involved in the examples through discussion with experts and, in some cases, the educators involved in the practice. Underlying issues related to the use of the materials will also be discussed.

At this point in the project, with three satellite video "teleconferences" under our belts and two more being developed, we can look at what actually happened and begin to ask "why"?

2. Observations

Expectations for, and early applications of, any new tool are shaped by prior experiences with similar tools, by presumptions of purpose, and even by the terminology used.

In the January 1982 project design document, we noted that "the term 'teleconference' is beginning to take on generic meanings that make it difficult to know what is being described when it is used." We now have the personal experience to confirm that. It is increasingly popular to label anything that is broadcast via satellite as a teleconference. Yet the greatest share of what is transmitted this way (on our teleconferences, and those of others we have viewed) is one-way presentation that does not contain (or sometimes even need) the viewer interaction that the term "conference" implies.

We have observed that this general use of the label "teleconference" can raise expectations in the viewer's mind that can result in dissatisfaction with a presentation that was never intended to be anything more than a presentation.

It has appeared, at times, that the confusion about terminology is paralleled by a similar lack of clarity about the purposes or role of the satellite telecast. This confusion seems to affect both the producers and the receivers of the information. For example, because the information is transmitted and received as "television", it is easy to perceive the activity in terms of the medium as we have known it until now--that is, a presentation as opposed to a communication medium. In most purposeful television presentations, audience needs and characteristics are anticipated but not specifically known. Audiences, therefore, are perceived in generalized terms such as "elementary teachers", "SEA staff", etc. Because the specific audience needs are not known it must be assumed that the presentation may "miss" some viewers who may neither want nor need the information. Consequently, production effort must be devoted to techniques to capture and hold attention.

Satellite telecasts however are not usually aimed at general audiences. Typically they have a more limited target audience who is known, can be specifically described, and whose needs can be more directly determined (e.g., Project BEST state team leaders, state reading specialists). In these cases, it may be assumed that the audience members want to receive or give information or they would not take part in the activity. The audience can be perceived and dealt with as participants, not viewers.

At these times the television activity can be perceived in a communications context with direct effects on both the content and production techniques.

One direct consequence of "old rules" and assumptions being applied to a new situation appears to be a failure to employ for effective communication several of the advantages that are inherent to satellite telecasting. These are:

- the effectiveness of organized audio and video presentations;
- the relatively low total cost for its use when the expense of moving people to one central meeting location is factored in; and

- the lack of time limitations usually found on open-circuit broadcast channels.

Instead, these same features sometimes are applied to producing longer, one-way presentations of information as well as "shotgun" presentations (reach as many as possible with as much information as possible). Token interaction may be included, and appears to be based on an assumption that interaction means an exchange between presenter and receiver. Usually only one person at a site has access to a phone or microphone, and even then, there is seldom sufficient time for all sites to participate fully.

We have noted more effective interaction (i.e., in terms of contributing to the communications purposes of the teleconference) when the interaction can be among viewing sites or among the participants at any one site.

3. Reflections, Generalizations and Tentative Learnings

As part of determining how satellite telecasts might facilitate Project BEST communications, we have begun to develop some general thoughts, perceptions and rules-of-thumb about video teleconferences (i.e., telecasts used in an interactive communications context).

As we reviewed a number of teleconferences from education and business organizations (as well as our own), we became aware of some similarities and differences in the ways that teleconferences were being used by these two sectors. First, teleconferences are, in the main, being used as purposeful tools by organizations with a communications problem or task. This led us to look at the broader picture of the types of communications problems all organizations deal with. It was here that we noted that two communication systems exist in most of our work settings. One, formal communications channels and mechanisms provided to ensure that decisions are carried out efficiently. Most of the information flow through these channels is one-way. Second, and co-existing with these formal organizational channels, is an informal system of communications. Most of an organization's problems are resolved via these channels. Why? The channels, or linkages, are *purpose* or *task-related*, the participants have more *control* over the structure of the system and the content, it is more *interactive*, and there is a greater degree of *trust* because the participants know one another. Yet this process is seldom given legitimacy as a "system" and is kept relatively invisible.

Nevertheless, when we looked at where teleconferencing and other interactive telecommunications media appeared to be of most value today, it was apparent that it was for these *"informal"* organizational communications. (Note the increasing number of television commercials for audio and video teleconferencing--they always show a group of people who know one another in a problem-solving situation.) Yet in education, as opposed to industry, the largest proportion of video teleconferences that we observed were employing the medium for *formal*, predominantly one-way, organizational communication (e.g., to announce a decision, present new information, etc.). Interactivity, when it was included, was usually of the clarifying or challenging question type. Time for it was usually tacked on, was too short and too limited, i.e., only one person at each site could talk.

Why does education seem to differ from industry in using these technologies to enhance its own capabilities to resolve its problems? Two reasons may be:

- Most educational professionals are dealt with as "independent practitioners." They do not have jobs that legitimately require them to interact with individuals outside their offices or classrooms to solve problems. This latter type of interaction is done, usually on one's own time, at professional meetings, through phone calls to peers, and indirectly via access to research.
- In education there is relatively less experience using telecommunications (till now, television and radio) as a management problem-solving tool. Over the years, the earnest endeavors to discover unique contributions of these media to teaching and learning have focused more on the content of education than its process. The concern has been more for what and how to present information to students via media than how to solve the problems that constrain good teaching and learning situations. Telecommunications technologies, therefore, have had few opportunities to be used for improving the lot of those who deal on a daily basis with the problems of "running the shop."

Some aspects of the above situations are not going to change right away. Most of us in education will continue to solve our problems primarily with the resources available at our sites. However, there are educators who frequently conduct work with individuals who are separated by distance. Among these are the two primary organizational participants of Project BEST--state education agencies and educational professional associations.

The question is whether we can begin to apply this technology to the processes of education that we influence. Can we take the little bit we already know about interactive telecommunications from our life-long experience--for example, with telephones--and combine it with what we know is effective with small work groups? Can we provide functional models for ourselves and our members or constituents from which we all can learn?

What could the benefits be? Many have said that education cannot be changed. True, but that is not the same as saying that education cannot change itself... if it had a way to connect itself to its own resources to solve its own problems. This is not centralization, but rather connecting decentralized decision-makers so that they have access to each other's experience to enhance local decisions.

To further that end, here are some of the rules of thumb we are developing for our own use in producing Project BEST's satellite video teleconferences:

1. Transmission of a video presentation by satellite may add an air of importance to an activity. However, the novelty quickly wears off if the information being presented does not meet a need of those receiving it. We now have the capability to deliver information to specific individuals and groups to meet specific needs. Be clear about the purposes of the satellite telecast and its relationship to the needs of the primary audience(s).
2. Do not be afraid to be "too specific." Understanding of any particular information is enhanced when the presenter structures it toward a specific need. This does not mean that others cannot also receive and understand that information. We do this every day--learning from information intended for others. It is the clarity resulting from having a specific target that produces the more effective presentation of the information.

3. Determine the organizational relationships of the participants and how the teleconference relates to their work.

   -- Are the reception sites organizationally under the "control" of those developing the presentation? Is the purpose to have them all get the same things out of the activity?

   -- Is there a national agenda that is structuring the meeting? Or is the television presentation supporting local agendas at each reception site?

4. If the receiving sites are, in fact, "participants" and not semi-passive "viewers," you will need a receiving site spokesperson who does more than manage logistics. If the centrally-televised portion of the conference is to be useful, you will need a way to anticipate its relevance to the varying local situations. After all, it will be their objectives for the meeting (not yours alone) that determine whether your communication is successful.

5. Be clear about the nature and extent of interaction that will be possible. Make sure that the teleconference participants have these same expectations.

   Interaction with the presenters of the material is no more necessary for video presentations by satellite than it is for video presentations by cable, broadcast, or other means. Interaction or involvement with the ideas being presented is important, however, for effective communication. Interaction can serve several needs of the participants:

   -- to clarify information through questions;

   -- to internalize information through discussion; and

   -- to add to or exchange information.

   Determining who should be involved in the interaction should be one of the first considerations for the satellite video communicator. Options include:

   -- discussion among participants at each viewing site;
   -- interaction among viewing sites; and
   -- interaction between viewing sites and the presenters.

   When the interaction takes place should also be considered. Unless there is some developmental purpose for feeding information back into the "live" communication process, it does not necessarily have to be part of the satellite broadcast.

6. Does every video element have to be part of the real-time telecast? Consider transmitting ahead of time those presentational portions that might be shown at the local site at other times, before or after the broadcast.

7. Make sure the human relationships that the telecommunications linkage is reinforcing are provided for--that is:

    -- Don't expect open communication if the participants don't, to some extent, know or trust one another.

    -- Don't expect a common response unless participants have a mutual concern or need.

    -- Expect to devote some effort to verifying and/or establishing these relationships before the teleconference. It will ensure communication and decrease the need for nonfunctional attention holding television production techniques.

VIDEOTAPE AS AN EXPERIENCE-LINKER

1. Intentions

Project BEST's plan to develop videotaped materials that states could use with local schools responds to three conditions. First is the lack of a research or experience base for schools to turn to as they consider the use of microcomputers. They have to rely on each other, as evidenced by the great number of local user networks and new practitioner-oriented computer magazines and newsletters. Second is the evolving nature of the information schools are seeking. Changes in hardware and software and continuing development of new classroom applications make it practically impossible to provide specific how-to-do-it information. Moreover, what most people really seek is sufficient data to give them the confidence to make their own decisions. This type of information can include the fact that others are making similar decisions without great risk, or that they already have the data to make the decision but did not realize it.

Third, and finally, the project recognizes that television is not a medium best used for communicating "facts" As Neil Postman has noted, television presents experience, not commentaries about experience.* Consequently, it makes sense to capitalize on this strength of the medium and use it to deal with the current need for experience exchange in local schools. Thus an early Project BEST planning document stated:

> Videotape Case Studies
>
> These videotapes will document the key experiences of school practitioners who have been using microcomputers effectively in basic skills education. They will be short, organized in a manner that will allow variations in use, and not become outdated in a short time.
>
> Each video module will be designed for an audience of adults who work in or with education. These people know what children look like and are not turned on by pictures of kids being happy with hardware (although a review of most "demonstration" materials might suggest otherwise). What they seek instead

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*"Engaging Students in the Great Conversation", Phi Delta Kappan, January 1983

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(observe their behavior in meetings with peers) is information from others in situations like theirs, for example:

- -- what the technology allows them to do or accomplish;
- -- what's involved and how they handle it;
- -- how they feel;
- -- what didn't work and what they learned from it;
- -- what constraints they had to deal with and how.

The project set out to develop four of these videotapes or modules. Each tape was designed to address a concern of local educators that was likely to continue for a number of years. The topics selected were:

- getting started with the new technologies;
- learning and teaching about computers;
- deciding about hardware and software; and
- teaching with microcomputers

Each tape module illustrates how a number of schools with varying resource bases dealt with a common issue. (Six very different school districts served as sites for videotaping: Cincinnati, Ohio; Plains, Montana; Cupertino, California; Fairfax County, Virginia; Albany, Ohio; and Ann Arbor, Michigan.) The final modules are intended to be used as triggers--that is, to create the interest and awareness necessary to motivate viewers to seek further information, appropriate and relevant to their specific situations.

At the point where these observations and tentative generalizations are being documented, all of the field taping is completed. However, only one of the modules has been disseminated to the states, one is part of the May teleconference activities, and the remaining two will be completed in time for the June activites. The following should be read, therefore, remembering these limitations on the extent of our present experience.

2. Observations

A. What the Viewer Brings to the Viewing Experience: We have noted that people with local school experience react to the modules differently than those with other orientations. This might have been expected. To communicate effectively, one has to find a "handle" in the mind of the receiver to grab hold of. Since our primary audience is at the local school level, we chose problems and experiences that most local educators would immediately relate to (e.g., parent pressures, feelings when students know more than teachers, troubles getting technology to work the way it's supposed to). These may not be issues that policy makers, academics, or technology specialists find of primary importance.

Without one's own experience to link and give meaning to the information on the videotape, a viewer might see nothing but the pictures on the screen. Instead of triggering personal pictures of possibilities in the viewer's mind, the tape would appear to contain nothing but talking heads and computer classrooms.

B. Capturing and Portraying the Multi-Dimensions of Reality: Printed articles and case studies can seldom capture the multi-dimensional realities of a school. When we made the first of our two visits to each school district, we quickly discovered that the printed materials and references on which we had based our site selection had seldom captured the complete picture of what was happening. By their nature, articles and other printed materials reflect the point of view of the writer, intentionally or not.

Whether or not the video modules will better capture the multi-dimensional reality of the school is yet to be seen. The potential is there. In several cases, we were able to get varying points of view on the same event that can be used for contrast or to show the range of perception and understanding that can exist.

C. Unanticipated Consequences: Our taping produced unanticipated effects on the school districts we visited. The interview process was structured to elicit what it was like to be that person at that time in that specific situation. We wanted people to talk only about what they knew from their own experience, not what they believed others should do.

To get this information, the interview process focused on specific issues or concerns but within a personal framework of what the speaker had done or was doing, what his/her problems were, and what he/she had learned from them.

This reflective process proved successful in generating the type of experiential narrative that communicates so effectively.* It had unanticipated effects for the schools we visited, however. In almost every case, we have received direct feedback that the reflective act of providing information to us gave the districts new insights that resulted in improvements in their activities.

Thus the situation at each site is no longer what it was when we visited it. This is an additional reason not to view the video modules as case studies of the districts visited.

3. Generalizations

We believe we are learning something about the value of television for connecting people so they may profit from each other's experiences. We are also learning something about the effects of education's 25-year ITV experience on our perceptions of "good" and "bad" use of the medium.

Television is an attention-centered medium. Information goes by only once. You can't go back, scan, and repeat as with printed material.** If information is to be communicated by television the mind of a viewer must be kept "connected' to the picture and sound.

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*Recent brain research suggests that the mind organizes information in a narrative format. It tries to understand and make sense of information by tying it together into a logical "story." This may explain why some people find information encapsulated in personal experiences easy to recall.

**This is less true with TV via tape or disc, but it still requires more energy and time than the almost-instantaneous process of glancing back at a page.

Techniques such as pacing, visual effects, interesting compositions, etc., can help. These are only enhancements however. The basic "connector" must come from the viewers themselves. They must want or be interested in what is being communicated. One of the strongest connectors is a perception that the information is useful and relevant to one's own needs.

The dilemma we had to face in putting the modules together from the taped personal interviews was whether or not persons talking about their own experiences would hold viewers' attention. Did they need to be enhanced with semi-related pictures that attempted to recreate what was being described?

From our own ITV experience, many of us have an aversion to what we saw as "talking heads." This may be because in the past these were heads that were talking *about* rather than recreating the experience. In many cases, television teachers played the role they had played in the classroom--presenting information about others' experiences. Since, as noted earlier, TV is a poor medium for talking *about* experience, pictures and production effects had to be added to capture and hold viewer attention. The "talking head" became a "no-no."

What we may have missed by mindlessly applying that rule is that there were teachers and others on television, or in a classroom, who seemed to hold the students' attention without additional effects. These were individuals for whom the subject matter was their life. They loved and lived their subject to the extent that facts came out flavored with human feelings. The subject matter *was* their experience. When this was coupled with dramatic ability, the viewer could be made part of that experience (Leo Buscaglia can serve as a current example). Both information and feelings could be communicated. In this type of situation, the medium achieves what it does best. It links the viewer's mind directly to the presenter's experience.

Our experience, so far, with Project BEST video materials tends to confirm this view. Individuals directly involved in an activity can communicate, via TV, a sense of what they have experienced to a degree no less than is achieved when one makes a personal visit to a school. Viewers can come away with information and feelings.

This does not mean that these types of videotaped materials should be all "talking heads," or that we are not concerned about the pictorial quality of what is on the video tapes. On the contrary, we are very concerned about a "talking head," but it is not necessarily the one on the screen. Rather it is the little voice in the head of the viewer--the voice that provides continuing commentary on what is being seen and heard. Ideally, the TV communicator wants this voice to be "in sync" with the information being presented. Communication is blocked when the little voice starts making social commentary or wondering about elements of the picture that have little to do with the message being communicated. This type of "talking head" continues to be a continuing concern for us--to know, for example, when a picture of children using computers in a classroom will enhance what a.teacher is saying about her particular classroom application, and when it will start the little "talking head" noting what brands of computers are used, how many girls are in the class, etc.

DIALOGUE

We have provided in this paper examples of what we are learning from the Project BEST experience with two specific video technologies. While many of these thoughts derive from your reactions and feedback, we do not presume that these are the same things you may be learning. We do know, however, that we can both learn more if we can exchange our views.

Not all of you may want or need to think about the issues we have dealt with here. For those of you who do, we will welcome your reactions. To continue the dialogue, we will synthesize your comments and feed them back to those of you who indicate interest.

AREA EDUCATION AGENCY 16

FT. MADISON, IOWA

SUMMARY

- Tax-supported regional service agency in small rural farming community in Southeastern Iowa
- Staff of 180
- Serves 13 school districts; average school population of 1,540; covers 1,620 square miles
- Began computer literacy program using microcomputers in 1980 for interested school districts

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The Great River Area Education Agency (AEA) #16 in Ft. Madison, Iowa is a tax-supported regional service agency serving 13 school districts in Southeastern Iowa. During the 1978-79 school year, AEA 16 placed an Apple II microcomputer in each of the 13 school districts. In 9 of the districts, the micro was used to support computer programming courses at the secondary level. The following year, elementary school principals requested the help of AEA 16 in forming a plan for using microcomputers at the K-6 level. In March of 1981, a computer literacy pilot project was initiated in four of the school districts. Three months later, the project was expanded to include all public school districts in AEA 16 and was also extended to the junior high school level.

The Great River Area Education Agency was the first AEA in Iowa to become involved with microcomputers. Dr. Jerry Doyle, a math and science consultant in the Educational Services Division of AEA 16, responded to the great demand of teachers and superintendents in several school districts for inservice training on microcomputers. Doyle attended a conference sponsored jointly by the Minnesota Educational Computing Consortium (MECC) and the Association for Educational Data Systems (AEDS) to learn more about educational computing. He saw a good deal of computer-assisted instruction (CAI) efforts but felt that CAI was not the approach AEA 16 should take. It was too expensive because the ratio of students to computers should ideally be 2:1, and there was not any software available for CAI that met Doyle's satisfaction. He felt computer literacy was necessary before any applications could be made.

Many of the school districts were already involved in computer application activities on their own, under the leadership of an interested teacher or principal, but they had no cohesive plan. Doyle wanted to give them direction and unity but found it difficult to stay more than one step ahead of the schools themselves. He solicited the help of high school math teacher Ed Rolenc (pronounced Rawlins), who was very interested in microcomputers and was using them in his classes in the Mt. Pleasant School District.

In the spring of 1981, Doyle began holding half-day inservice classes for interested teachers. A formal staff development course began the following summer, with teachers getting credit for the 15-hour series of classes. Other classes are offered during the school year at 4:15 p.m. for teachers only. Administrators are given their own inservice sessions at different times. Doyle finds that administrators, like teachers, learn best among their peers. "It takes a secure administrator," Doyle notes, "to attend a teacher workshop." Most of the teachers at the workshops are there voluntarily and have an interest in learning about microcomputers. Doyle observes, however, that occasionally a principal will "nudge" a teacher to attend an inservice session. Many community people also attend the classes. In one instance, eight employees from Northwestern Bell attended a workshop at the suggestion of their supervisor.

In developing the computer literacy curriculum that was used, Ed Rolenc revised and re-wrote Radio Shack's Computer Education Series Parts I and II to suit grades 3-8. He also modified Lesson Seven of Part I of the curriculum, designed for use with the Model I and III, to suit the Color Computer. In November of 1981, AEA 16 purchased 164 Radio Shack Color Computers for the area elementary and junior high schools. The move from Apple to Radio Shack was made for several reasons:

1. The Radio Shack computers come with a teaching packet.

2. It was hard to find servicing for the Apples. Radio Shack, on the other hand, has six outlets in Southeastern Iowa.

3. The Radio Shack Color Computers were purchased at a 22% discount.

Backup machines are kept at the AEA 16 offices and sent out to any schools in which the machine(s) is being repaired.

Software for the school districts comes from several different sources, both internal and external. The AEA 16 disseminates materials that it receives from educational computing organizations such as MECC, CUE (Computer-Using Educators), and Softswap. There is also a state-wide users group in Iowa and a newsletter for the Color Computer called De-Bug in which all the articles are written by teachers. Teachers in the district also write some of the software programs. All software is previewed at AEA 16 before going out to the schools.

In the computer literacy curriculum for grades 3-8, AEA 16 set specific goals for the student. In a paper prepared by Jerry Doyle, The Area 16 Computer Literacy Project, the following objectives are listed:

The student will:

1. be able to enter and run a simple program on a computer.

2. be able to use the tape machine for saving programs and loading programs or lessons (CAI) into the computer.

3. be able to interpret what a simple program will accomplish when it is run on a computer.

4. become familiar with the meaning of selected computer terms and concepts.

5. become confident about his/her ability to use and control a computer.

Although most of the districts are heavily into educational computing, some are very reluctant to get involved with microcomputers. Doyle has special strategies that he uses to "prime the pump" in these districts. He finds that an enthusiastic superintendent will see to it that his or her district initiates a computer literacy curriculum. However, in instances where the necessary support from the administration is not there, Doyle works with interested teachers to spread the excitement in a district. If that fails, he moves to the community. Parents who want their children to have computer experience are particularly effective as lobbyists and advocates in a school district that is dragging its heels in getting involved with instructional technology.

AEA 16 is proud of the work it has done for its 13 school districts. Everything they have accomplished was financed with local tax dollars and stemmed from an interest at the local level. It was truly a grassroots movement--not a top-down mandate from administration. Doyle believes these two factors are important to their success in the computer literacy project. "You're more committed when you use your own money," he says. Since the initiation of this computer literacy effort, AEA 16 has also decided to update its offices and move to computer-based management for puposes of administration. They hired Ed Rolenc as a consultant to write business programs to fit their needs. Much of the inservicing is now the responsibility of individuals in the various school districts. Activities in instructional computing are coordinated by Dr. William Wise who was hired by the AEA in 1982 as supervisor of computer services.* For more information about the computer literacy project in Ft. Madison, Iowa, contact:

Dr. William Wise
Great River Area Education Agency 16
305 Avenue F
Ft. Madison, Iowa 52627
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*Jerry Doyle left the AEA in August of 1983. He has accepted a similar position with the Sheboygan, Wisconsin School District.

WAYNE PUBLIC SCHOOLS
WAYNE, NEW JERSEY

DISTRICT SUMMARY

- A computer "co-op" offering schools instructional and administrative services on mini-computer time-sharing systems since 1970
- Now offering microcomputer-related products and services to Co-op members
- A professional society for instructional computing "...whose members include educators throughout the state of New Jersey..."
- Works collaboratively with other agencies such as the regional Educational Improvement Center (EIC) established by the state of New Jersey
- Established a self-governing network interrelating school districts to facilitate microcomputer teacher in-service
- Staff of 10-15 (Co-op)
- Serves over 140 schools in over 90 districts

Wayne Public Schools in Wayne, New Jersey, provides a variety of computer-related services to over 90 school districts in New Jersey. In 1970, at the suggestion of Dr. Henry J. Petersen, Mathematics Supervisor, the Wayne Board of Education decided to make its time-sharing computers more cost-effective by offering various administrative and instructional services to other school districts at a nominal fee. Petersen recognized the need for low-cost computer services to school districts with restrictive budgets and, through his own informal network, obtained verbal commitments from 10 school districts to start a computer "co-op." The number of users rapidly grew from the original 10 to over 90.

In the late seventies, the focus on computers in education shifted from central computers to the micro. Co-op users expressed interest in the instructional uses of microcomputers in the classroom, but had no leadership or source of information. Petersen took advantage of the opportunity to expand the scope of the co-op and to draw more users by offering microcomputer services. With the approval of the school board, he enrolled Wayne Public Schools as an institutional member of the Minnesota Educational Computing Consortium (MECC). This allowed the co-op to distribute MECC materials to other co-op users at a discount. It also provided a databank of instructional computing resources to co-op members.

The co-op focuses on networking and experience-sharing among its membership as a means of avoiding the "re-inventing the wheel" syndrome. It relies on communication between school districts and offers an opportunity for school districts to unify their efforts to integrate the use of microcomputers into the school curriculum. Through MECC, it is able to offer "products," such as instructional programs, software libraries, information on purchasing, using and interfacing hardware, etc., which in turn attract new co-op members. It also brokers contracts with other software vendors to offer copyrighted programs at a discount.

The new Network for Action in Microcomputer Education (N.A.M.E.) has assumed a role traditionally held by Educational Improvement Centers (EICs) in New Jersey. Since Wayne Public Schools organized the co-op before the regional EIC became involved with instructional computing, they were able to continue working in the microcomputer area and had developed a working relationship with the EIC to jointly serve as a resource for New Jersey schools. The EIC spread the word about the co-op to other school districts. It offered some in-service classes for interested teachers and provided them with a demonstration center where they previewed hardware and software, including MECC materials on loan from the Wayne co-op. As part of a 1983 state educational reorganization, the regional Educational Improvement Centers ceased to exist. Former EIC resources, consultants, contacts and knowledge are now being collectively applied by N.A.M.E. N.A.M.E. has teacher in-service as its initial focus. It is a true "grass-roots" effort stimulated by the EIC vacuum. N.A.M.E. is a logical outgrowth of the Wayne co-op.

Last year, Dr. Petersen, working with concerned educators, established a microcomputer users group called CLUES (Computers, Learners, Users, Educators - Association). Modeled after California's CUE (Computer Using Educators), CLUES is a "professional society for instructional computing" in the state of New Jersey. CLUES offers a variety of services to its members including discounts on computing journals, information on hardware and software, tips on maintenance, a newsletter, meetings, workshops and other computer-related activities. CLUES is affiliated with the International Council for Computers in Education at the national level and the New Jersey Education Association at the state level. These contacts provide avenues through which computer information can be delivered to individual educators at all levels.

Between CLUES, N.A.M.E. and the Wayne co-op, Dr. Petersen keeps quite busy acting as resource person, trouble-shooter, promoter, and liaison for school districts in New Jersey. These organizations serve important roles for schools and educators faced with the dilemma of needing current information on microcomputers in education. They also offer an interesting model for local and regional cooperation in technical assistance, resource sharing, and information dissemination to the schools. For more information about the Wayne co-op, CLUES, and N.A.M.E., contact:

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Basic
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No. 1

VIDEO
as a Medium
for Sharing Experiences

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VIDEO AS A MEDIUM FOR SHARING EXPERIENCE

> "...In addition to giving us a reason and opportunity to communicate with each other, we will also have an opportunity to learn about the potentials, effects, and consequences of these technologies we'll be using..."
>
> Project BEST orientation videotape, June 1982.

PURPOSE

Learning is an exciting process when our own experiences provide the information that feeds the process. Unfortunately, once we leave childhood we rely increasingly on information derived from other people's experiences (research, publications, etc.). Opportunities for direct experience with totally new situations become infrequent. In that sense one of the "fortunate" aspects of living through this early stage of the information technology revolution is that the research and previous experience do not exist. We have to give credence to our own feelings, judgements and perceptions.

One of Project BEST's purposes is to stimulate that personal process--to use the new technologies as tools in the conduct of project work, then to provide opportunities to reflect on that use and to see what can be learned from our own reactions. The intent of this paper is to trigger and expand that reflective process.

During this year we have systematically solicited and collected your feedback by phone, mail and electronic mail. We have also documented our own perceptions. These reactions have been an invaluable element of this process. They have allowed us to reflect on our original intentions and assumptions, as well as our actions, and to ask "why?". Our answers to that question are presented in this first "learnings" paper. We hope they prompt reactions and further exchange that will allow this process to better inform the future technology decisions each of us may be called upon to make.

INTRODUCTION

People are usually surprised when we tell them that Project BEST is not a "microcomputer" project, for most of the content of our communication deals with this revolutionary new technology. Our own view of the project's purpose is more accurately portrayed in our logo--"People-to- People: the BEST Approach." We are attempting to use information technologies to connect people who share similar concerns in ways that will facilitate their ability to solve their own problems. In January 1982, the project described its intentions as follows:

> As a dissemination project, Project BEST is in the business of *communication*--communicating *about* technology. As Drucker notes, real communication is not created *by* technology. Technology can only provide the links or structures that extend, enhance, and/or connect certain mutual needs to exchange information. Each of the project's uses of technology, therefore, will be determined within a broader context of the *purposes* of the two-way communication of which it is part....
>
> ...We will choose our media against the reference point of what we are trying to accomplish and communicate (about both the content *and* the medium we are using to communicate it). Our choices also will be functionally appropriate to the task in which the project and the states are engaged. Task-relating the technology is important to counteract the history of "technology demonstrations" where the participants' role is limited to observation or "playing" with the technology. Thus they possibly come away impressed, but with no personal experience that ties the technology to the real world conditions they face.
>
> ...We will provide *functional experience* with the new information communication technologies so that participants can experience the benefits and generalize them to their own situations.

We now have a year's experience using four technologies to address project communication needs:

- satellite telecasts for broad dissemination of materials and expertise;
- videotape to record current school experience with the new technologies;
- electronic mail for point-to-point exchange and access to current resource lists; and
- audio teleconferences for interaction, questioning, and idea exchange.

The subjects of this paper are the two video technologies. A second paper, to be distributed as part of the June, 1983 Project BEST teleconference, will address the more interactive technologies of electronic mail and audio conferencing.

The framework for presenting the information on each of the video technologies is:

- our intentions and assumptions;
- our observations of what occurred; and
- our reflections, generalizations and tentative learnings.

SATELLITE TELECONFERENCES: PRESENTATION OR COMMUNICATION?

1. Intentions

When Project BEST was being developed the thought was that the teleconferences would serve as *work sessions* involving project staff and state team members. The focus for the live communication exchange would be the video modules and other awareness/training materials that the project was developing for SEA use.

> The satellite *video teleconference* will serve as a meeting between the developers and users of the video materials. During the teleconference, contextual information will be presented about issues or principles involved in the examples through discussion with experts and, in some cases, the educators involved in the practice. Underlying issues related to the *use* of the materials will also be discussed.

At this point in the project, with three satellite video "teleconferences" under our belts and two more being developed, we can look at what actually happened and begin to ask "why"?

2. Observations

Expectations for, and early applications of, any new tool are shaped by prior experiences with similar tools, by presumptions of purpose, and even by the terminology used.

In the January 1982 project design document, we noted that "the term 'teleconference' is beginning to take on generic meanings that make it difficult to know what is being described when it is used." We now have the personal experience to confirm that. It is increasingly popular to label anything that is broadcast via satellite as a teleconference. Yet the greatest share of what is transmitted this way (on our teleconferences, and those of others we have viewed) is one-way presentation that does not contain (or sometimes even need) the viewer interaction that the term "conference" implies.

We have observed that this general use of the label "teleconference" can raise expectations in the viewer's mind that can result in dissatisfaction with a presentation that was never intended to be anything more than a presentation.

It has appeared, at times, that the confusion about terminology is paralleled by a similar lack of clarity about the purposes or role of the satellite telecast. This confusion seems to affect both the producers and the receivers of the information. For example, because the information is transmitted and received as "television", it is easy to perceive the activity in terms of the medium as we have known it until now--that is, a presentation as opposed to a communication medium. In most purposeful television presentations, audience needs and characteristics are anticipated but not specifically known. Audiences, therefore, are perceived in generalized terms such as "elementary teachers", "SEA staff", etc. Because the specific audience needs are not known it must be assumed that the presentation may "miss" some viewers who may neither want nor need the information. Consequently, production effort must be devoted to techniques to capture and hold attention.

Satellite telecasts however are not usually aimed at general audiences. Typically they have a more limited target audience who is known, can be specifically described, and whose needs can be more directly determined (e.g., Project BEST state team leaders, state reading specialists). In these cases, it may be assumed that the audience members want to receive or give information or they would not take part in the activity. The audience can be perceived and dealt with as participants, not viewers.

At these times the television activity can be perceived in a communications context with direct effects on both the content and production techniques.

One direct consequence of "old rules" and assumptions being applied to a new situation appears to be a failure to employ for effective communication several of the advantages that are inherent to satellite telecasting. These are:

- the effectiveness of organized audio and video presentations;
- the relatively low total cost for its use when the expense of moving people to one central meeting location is factored in; and

- the lack of time limitations usually found on open-circuit broadcast channels.

Instead, these same features sometimes are applied to producing longer, one-way presentations of information as well as "shotgun" presentations (reach as many as possible with as much information as possible). Token interaction may be included, and appears to be based on an assumption that interaction means an exchange between presenter and receiver. Usually only one person at a site has access to a phone or microphone, and even then, there is seldom sufficient time for all sites to participate fully.

We have noted more effective interaction (i.e., in terms of contributing to the communications purposes of the teleconference) when the interaction can be among viewing sites or among the participants at any one site.

3. Reflections, Generalizations and Tentative Learnings

As part of determining how satellite telecasts might facilitate Project BEST communications, we have begun to develop some general thoughts, perceptions and rules-of-thumb about video teleconferences (i.e., telecasts used in an interactive communications context).

As we reviewed a number of teleconferences from education and business organizations (as well as our own), we became aware of some similarities and differences in the ways that teleconferences were being used by these two sectors. First, teleconferences are, in the main, being used as purposeful tools by organizations with a communications problem or task. This led us to look at the broader picture of the types of communications problems all organizations deal with. It was here that we noted that two communication systems exist in most of our work settings. One, formal communications channels and mechanisms provided to ensure that decisions are carried out efficiently. Most of the information flow through these channels is one-way. Second, and co-existing with these formal organizational channels, is an informal system of communications. Most of an organization's problems are resolved via these channels. Why? The channels, or linkages, are *purpose* or *task-related*, the participants have more *control* over the structure of the system and the content, it is more *interactive*, and there is a greater degree of *trust* because the participants know one another. Yet this process is seldom given legitimacy as a "system" and is kept relatively invisible.

Nevertheless, when we looked at where teleconferencing and other interactive telecommunications media appeared to be of most value today, it was apparent that it was for these *"informal"* organizational communications. (Note the increasing number of television commercials for audio and video teleconferencing--they always show a group of people who know one another in a problem-solving situation.) Yet in education, as opposed to industry, the largest proportion of video teleconferences that we observed were employing the medium for *formal*, predominantly one-way, organizational communication (e.g., to announce a decision, present new information, etc.). Interactivity, when it was included, was usually of the clarifying or challenging question type. Time for it was usually tacked on, was too short and too limited, i.e., only one person at each site could talk.

Why does education seem to differ from industry in using these technologies to enhance its own capabilities to resolve its problems? Two reasons may be:

- Most educational professionals are dealt with as "independent practitioners." They do not have jobs that legitimately require them to interact with individuals outside their offices or classrooms to solve problems. This latter type of interaction is done, usually on one's own time, at professional meetings, through phone calls to peers, and indirectly via access to research.
- In education there is relatively less experience using telecommunications (till now, television and radio) as a management problem-solving tool. Over the years, the earnest endeavors to discover unique contributions of these media to teaching and learning have focused more on the content of education than its process. The concern has been more for what and how to present information to students via media than how to solve the problems that constrain good teaching and learning situations. Telecommunications technologies, therefore, have had few opportunities to be used for improving the lot of those who deal on a daily basis with the problems of "running the shop."

Some aspects of the above situations are not going to change right away. Most of us in education will continue to solve our problems primarily with the resources available at our sites. However, there are educators who frequently conduct work with individuals who are separated by distance. Among these are the two primary organizational participants of Project BEST--state education agencies and educational professional associations.

The question is whether we can begin to apply this technology to the processes of education that we influence. Can we take the little bit we already know about interactive telecommunications from our life-long experience--for example, with telephones--and combine it with what we know is effective with small work groups? Can we provide functional models for ourselves and our members or constituents from which we all can learn?

What could the benefits be? Many have said that education cannot be changed. True, but that is not the same as saying that education cannot change itself... if it had a way to connect itself to its own resources to solve its own problems. This is not centralization, but rather connecting decentralized decision-makers so that they have access to each other's experience to enhance local decisions.

To further that end, here are some of the rules of thumb we are developing for our own use in producing Project BEST's satellite video teleconferences:

1. Transmission of a video presentation by satellite may add an air of importance to an activity. However, the novelty quickly wears off if the information being presented does not meet a need of those receiving it. We now have the capability to deliver information to specific individuals and groups to meet specific needs. Be clear about the purposes of the satellite telecast and its relationship to the needs of the primary audience(s).
2. Do not be afraid to be "too specific." Understanding of any particular information is enhanced when the presenter structures it toward a specific need. This does not mean that others cannot also receive and understand that information. We do this every day--learning from information intended for others. It is the clarity resulting from having a specific target that produces the more effective presentation of the information.

3. Determine the organizational relationships of the participants and how the teleconference relates to their work.

   - Are the reception sites organizationally under the "control" of those developing the presentation? Is the purpose to have them all get the same things out of the activity?
   - Is there a national agenda that is structuring the meeting? Or is the television presentation supporting local agendas at each reception site?

4. If the receiving sites are, in fact, "participants" and not semi-passive "viewers," you will need a receiving site spokesperson who does more than manage logistics. If the centrally-televised portion of the conference is to be useful, you will need a way to anticipate its relevance to the varying local situations. After all, it will be their objectives for the meeting (not yours alone) that determine whether your communication is successful.

5. Be clear about the nature and extent of interaction that will be possible. Make sure that the teleconference participants have these same expectations.

   Interaction with the presenters of the material is no more necessary for video presentations by satellite than it is for video presentations by cable, broadcast, or other means. Interaction or involvement with the ideas being presented is important, however, for effective communication. Interaction can serve several needs of the participants:

   - to clarify information through questions;
   - to internalize information through discussion; and
   - to add to or exchange information.

   Determining who should be involved in the interaction should be one of the first considerations for the satellite video communicator. Options include:

   - discussion among participants at each viewing site;
   - interaction among viewing sites; and
   - interaction between viewing sites and the presenters.

   When the interaction takes place should also be considered. Unless there is some developmental purpose for feeding information back into the "live" communication process, it does not necessarily have to be part of the satellite broadcast.

6. Does every video element have to be part of the real-time telecast? Consider transmitting ahead of time those presentational portions that might be shown at the local site at other times, before or after the broadcast.

7. Make sure the human relationships that the telecommunications linkage is reinforcing are provided for--that is:

    - Don't expect open communication if the participants don't, to some extent, know or trust one another.
    - Don't expect a common response unless participants have a mutual concern or need.
    - Expect to devote some effort to verifying and/or establishing these relationships before the teleconference. It will ensure communication and decrease the need for nonfunctional attention holding television production techniques.

VIDEOTAPE AS AN EXPERIENCE-LINKER

1. Intentions

Project BEST's plan to develop videotaped materials that states could use with local schools responds to three conditions. First is the lack of a research or experience base for schools to turn to as they consider the use of microcomputers. They have to rely on each other, as evidenced by the great number of local user networks and new practitioner-oriented computer magazines and newsletters. Second is the evolving nature of the information schools are seeking. Changes in hardware and software and continuing development of new classroom applications make it practically impossible to provide specific how-to-do-it information. Moreover, what most people really seek is sufficient data to give them the confidence to make their own decisions. This type of information can include the fact that others are making similar decisions without great risk, or that they already have the data to make the decision but did not realize it.

Third, and finally, the project recognizes that television is not a medium best used for communicating "facts" As Neil Postman has noted, television presents experience, not commentaries about experience.* Consequently, it makes sense to capitalize on this strength of the medium and use it to deal with the current need for experience exchange in local schools. Thus an early Project BEST planning document stated:

> Videotape Case Studies
>
> These videotapes will document the key experiences of school practitioners who have been using microcomputers effectively in basic skills education. They will be short, organized in a manner that will allow variations in use, and not become outdated in a short time.
>
> Each video module will be designed for an audience of adults who work in or with education. These people know what children look like and are not turned on by pictures of kids being happy with hardware (although a review of most "demonstration" materials might suggest otherwise). What they seek instead

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*"Engaging Students in the Great Conversation", Phi Delta Kappan, January 1983

(observe their behavior in meetings with peers) is information from others in situations like theirs, for example:

- -- what the technology allows them to do or accomplish;
- -- what's involved and how they handle it;
- -- how they feel;
- -- what didn't work and what they learned from it;
- -- what constraints they had to deal with and how.

The project set out to develop four of these videotapes or modules. Each tape was designed to address a concern of local educators that was likely to continue for a number of years. The topics selected were:

- getting started with the new technologies;
- learning and teaching about computers;
- deciding about hardware and software; and
- teaching with microcomputers

Each tape module illustrates how a number of schools with varying resource bases dealt with a common issue. (Six very different school districts served as sites for videotaping: Cincinnati, Ohio; Plains, Montana; Cupertino, California; Fairfax County, Virginia; Albany, Ohio; and Ann Arbor, Michigan.) The final modules are intended to be used as triggers--that is, to create the interest and awareness necessary to motivate viewers to seek further information, appropriate and relevant to their specific situations.

At the point where these observations and tentative generalizations are being documented, all of the field taping is completed. However, only one of the modules has been disseminated to the states, one is part of the May teleconference activities, and the remaining two will be completed in time for the June activites. The following should be read, therefore, remembering these limitations on the extent of our present experience.

2. Observations

A. What the Viewer Brings to the Viewing Experience: We have noted that people with local school experience react to the modules differently than those with other orientations. This might have been expected. To communicate effectively, one has to find a "handle" in the mind of the receiver to grab hold of. Since our primary audience is at the local school level, we chose problems and experiences that most local educators would immediately relate to (e.g., parent pressures, feelings when students know more than teachers, troubles getting technology to work the way it's supposed to). These may not be issues that policy makers, academics, or technology specialists find of primary importance.

Without one's own experience to link and give meaning to the information on the videotape, a viewer might see nothing but the pictures on the screen. Instead of triggering personal pictures of possibilities in the viewer's mind, the tape would appear to contain nothing but talking heads and computer classrooms.

B. Capturing and Portraying the Multi-Dimensions of Reality: Printed articles and case studies can seldom capture the multi-dimensional realities of a school. When we made the first of our two visits to each school district, we quickly discovered that the printed materials and references on which we had based our site selection had seldom captured the complete picture of what was happening. By their nature, articles and other printed materials reflect the point of view of the writer, intentionally or not.

Whether or not the video modules will better capture the multi-dimensional reality of the school is yet to be seen. The potential is there. In several cases, we were able to get varying points of view on the same event that can be used for contrast or to show the range of perception and understanding that can exist.

C. Unanticipated Consequences: Our taping produced unanticipated effects on the school districts we visited. The interview process was structured to elicit what it was like to be that person at that time in that specific situation. We wanted people to talk only about what they knew from their own experience, not what they believed others should do.

To get this information, the interview process focused on specific issues or concerns but within a personal framework of what the speaker had done or was doing, what his/her problems were, and what he/she had learned from them.

This reflective process proved successful in generating the type of experiential narrative that communicates so effectively.* It had unanticipated effects for the schools we visited, however. In almost every case, we have received direct feedback that the reflective act of providing information to us gave the districts new insights that resulted in improvements in their activities.

Thus the situation at each site is no longer what it was when we visited it. This is an additional reason not to view the video modules as case studies of the districts visited.

3. Generalizations

We believe we are learning something about the value of television for connecting people so they may profit from each other's experiences. We are also learning something about the effects of education's 25-year ITV experience on our perceptions of "good" and "bad" use of the medium.

Television is an attention-centered medium. Information goes by only once. You can't go back, scan, and repeat as with printed material.** If information is to be communicated by television the mind of a viewer must be kept "connected' to the picture and sound.

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*Recent brain research suggests that the mind organizes information in a narrative format. It tries to understand and make sense of information by tying it together into a logical "story." This may explain why some people find information encapsulated in personal experiences easy to recall.

**This is less true with TV via tape or disc, but it still requires more energy and time than the almost-instantaneous process of glancing back at a page.

Techniques such as pacing, visual effects, interesting compositions, etc., can help. These are only enhancements however. The basic "connector" must come from the viewers themselves. They must want or be interested in what is being communicated. One of the strongest connectors is a perception that the information is useful and relevant to one's own needs.

The dilemma we had to face in putting the modules together from the taped personal interviews was whether or not persons talking about their own experiences would hold viewers' attention. Did they need to be enhanced with semi-related pictures that attempted to recreate what was being described?

From our own ITV experience, many of us have an aversion to what we saw as "talking heads." This may be because in the past these were heads that were talking about rather than recreating the experience. In many cases, television teachers played the role they had played in the classroom--presenting information about others' experiences. Since, as noted earlier, TV is a poor medium for talking about experience, pictures and production effects had to be added to capture and hold viewer attention. The "talking head" became a "no-no."

What we may have missed by mindlessly applying that rule is that there were teachers and others on television, or in a classroom, who seemed to hold the students' attention without additional effects. These were individuals for whom the subject matter was their life. They loved and lived their subject to the extent that facts came out flavored with human feelings. The subject matter was their experience. When this was coupled with dramatic ability, the viewer could be made part of that experience (Leo Buscaglia can serve as a current example). Both information and feelings could be communicated. In this type of situation, the medium achieves what it does best. It links the viewer's mind directly to the presenter's experience.

Our experience, so far, with Project BEST video materials tends to confirm this view. Individuals directly involved in an activity can communicate, via TV, a sense of what they have experienced to a degree no less than is achieved when one makes a personal visit to a school. Viewers can come away with information and feelings.

This does not mean that these types of videotaped materials should be all "talking heads," or that we are not concerned about the pictorial quality of what is on the video tapes. On the contrary, we are very concerned about a "talking head," but it is not necessarily the one on the screen. Rather it is the little voice in the head of the viewer--the voice that provides continuing commentary on what is being seen and heard. Ideally, the TV communicator wants this voice to be "in sync" with the information being presented. Communication is blocked when the little voice starts making social commentary or wondering about elements of the picture that have little to do with the message being communicated. This type of "talking head" continues to be a continuing concern for us--to know, for example, when a picture of children using computers in a classroom will enhance what a teacher is saying about her particular classroom application, and when it will start the little "talking head" noting what brands of computers are used, how many girls are in the class, etc.

DIALOGUE

We have provided in this paper examples of what we are learning from the Project BEST experience with two specific video technologies. While many of these thoughts derive from your reactions and feedback, we do not presume that these are the same things you may be learning. We do know, however, that we can both learn more if we can exchange our views.

Not all of you may want or need to think about the issues we have dealt with here. For those of you who do, we will welcome your reactions. To continue the dialogue, we will synthesize your comments and feed them back to those of you who indicate interest.

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No.2

BEST NET:

ELECTRONIC MAIL as a Medium for Educational Information Exchange and Networking

Prepared by:

Cheryl Petty Garnette
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Lewis A. Rhodes

August 19, 1983

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INTRODUCTION

Through BEST NET, a total of 70 institutions and state education agencies across the United States were given the opportunity to electronically access a variety of information resources on topical content areas relating to educational technology. It also provided a message exchange service to facilitate common problem-solving needs and to disseminate current practitioner experiences and first-hand knowledge about the use of technologies, such as the microcomputer, in schools.

BEST NET was the fourth technology in an arsenal of several communication media which Project BEST (Basic Education Skills through Technology) used in carrying out its role to provide technical assistance, disseminate current information and facilitate a functional "hands-on" experience for State Education Agencies (SEAs) in the application of the new information technology in education. Other media included audio and video teleconferencing, video tape, printed materials and facsimile transmission.[1]

As an interactive telecommunications media, BEST NET offered its users an opportunity to exchange ideas and request current information and materials from a variety of sources across the United States concerned with the use of new information technologies for basic skills instruction. Exhibit 1 illustrates the types of ideas and information that were exchanged.

The BEST NET was designed "...to provide a mechanism for sharing current information about the use of technology, such as the microcomputer, in education and...to promote active state participation in the development of Project BEST materials...and to facilitate the necessary networking of project staff with each other and the participating states as well as from one state or group of states with each other...during the life of the project."[2]

This task objective led to the implementation and support of the BEST NET electronic communication network that linked together 41 State Departments of Education and an array of leading information resources and educational practitioners concerned with the new information technology in education. BEST NET was initiated during the summer of 1982 under funding from the Office of Library and Learning Technologies, U.S. Department of Education and continued its operation through September 1983.

This paper reports on the use of this Project BEST technology as a means of communication between educators; it also synthesizes the significant learnings and experience that the opportunity to use the technology has provided Project BEST participants. The paper ends with a set of conclusions having possible implications for the use of electronic message systems in education. It underscores the potential of electronic networks of this nature for altering the ways in which people traditionally communicate and access information resources important to educational improvement and technological innovation.

Cheryl P. Garnette
Henry T. Ingle
Lewis A. Rhodes

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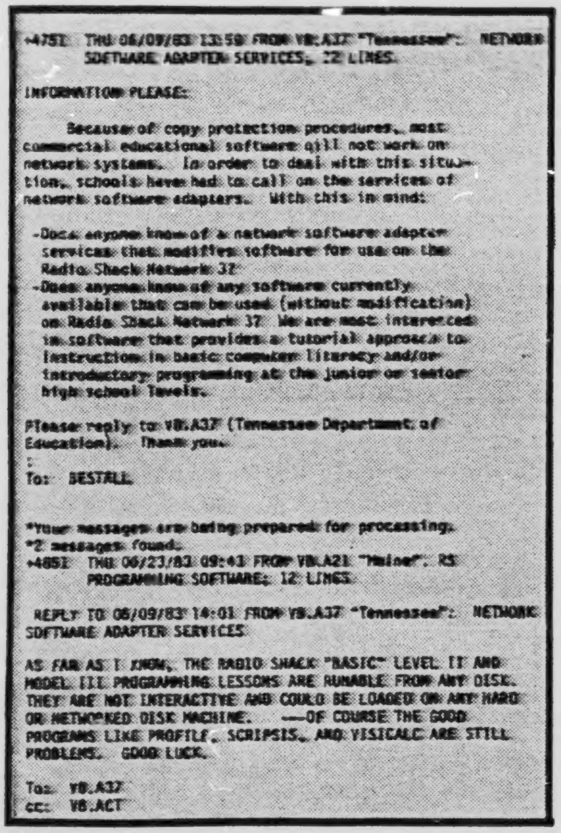
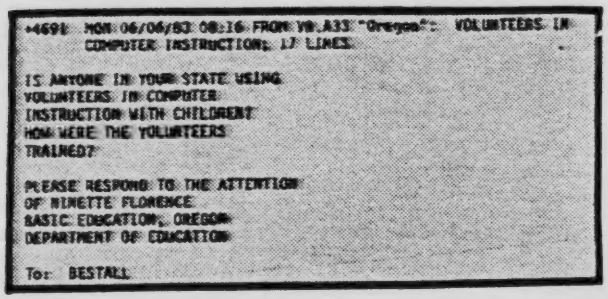
[1] An earlier paper prepared by Project BEST outlines significant learnings about the use of teleconferencing and related video technologies for the dissemination of educational information. This paper was distributed in May, 1983, as Paper No. 1--Video As A Medium For Sharing Experiences.

[2] Excerpt from Technical Proposal submitted to the U.S. Department of Education by the Association for Educational Communications and Technology in response to RFP #81-94, July 6, 1981.

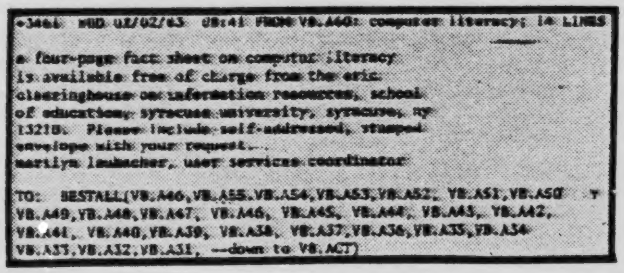
Exhibit 1--Examples of BEST NET Information/Message Exchange



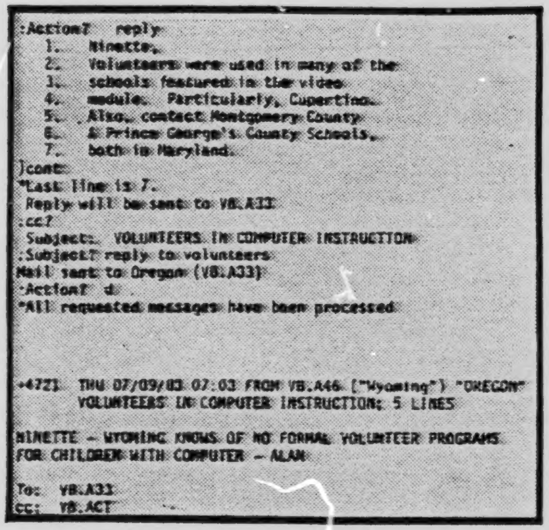
```
+4751  THU 06/09/83 13:59 FROM VB.A37 "Tennessee":  NETWORK
       SOFTWARE ADAPTER SERVICES; 22 LINES

INFORMATION PLEASE:

     Because of copy protection procedures, most
commercial educational software qill not work on
network systems.  In order to deal with this situa-
tion, schools have had to call on the services of
network software adapters.  With this in mind:

 -Does anyone know of a network software adapter
  services that modifies software for use on the
  Radio Shack Network 3?
 -Does anyone know of any software currently
  available that can be used (without modification)
  on Radio Shack Network 3?  We are most interested
  in software that provides a tutorial approach to
  instruction in basic computer literacy and/or
  introductory programming at the junior or senior
  high school levels.

Please reply to VB.A37 (Tennessee Department of
Education).  Thank you.
:
To:  BESTALL


*Your messages are being prepared for processing.
*2 messages found.
+4851  THU 06/23/83 09:41 FROM VB.A21 "Maine": RS
       PROGRAMMING SOFTWARE; 12 LINES

 REPLY TO 06/09/83 14:01 FROM VB.A37 "Tennessee":  NETWORK
SOFTWARE ADAPTER SERVICES

AS FAR AS I KNOW, THE RADIO SHACK "BASIC" LEVEL II AND
MODEL III PROGRAMMING LESSONS ARE RUNABLE FROM ANY DISK.
THEY ARE NOT INTERACTIVE AND COULD BE LOADED ON ANY HARD
OR NETWORKED DISK MACHINE.   ---OF COURSE THE GOOD
PROGRAMS LIKE PROFILE, SCRIPSIS, AND VISICALC ARE STILL
PROBLEMS.  GOOD LUCK.

To:  VB.A37
cc:  VB.ACT
```



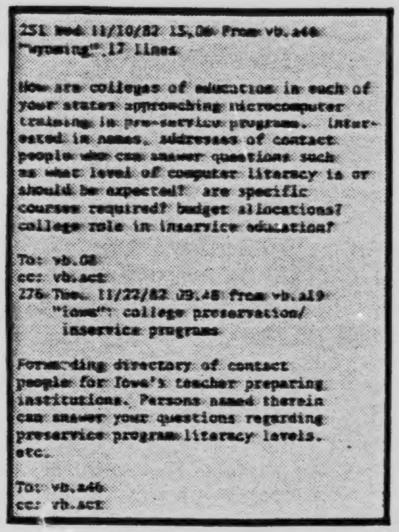
```
+4691  MON 06/06/83 08:16 FROM VB.A33 "Oregon":  VOLUNTEERS IN
       COMPUTER INSTRUCTION; 17 LINES

IS ANYONE IN YOUR STATE USING
VOLUNTEERS IN COMPUTER
INSTRUCTION WITH CHILDREN?
HOW WERE THE VOLUNTEERS
TRAINED?

PLEASE RESPOND TO THE ATTENTION
OF NINETTE FLORENCE
BASIC EDUCATION, OREGON
DEPARTMENT OF EDUCATION

To:  BESTALL
```



```
+3461  WED 02/02/83  08:41 FROM VB.A60: computer literacy; 14 LINES

a four-page fact sheet on computer literacy
is available free of charge from the eric
clearinghouse on information resources, school
of education, syracuse university, syracuse, ny
13210.  Please include self-addressed, stamped
envelope with your request...
marilyn laubacher, user services coordinator

TO:  BESTALL(VB.A46,VB.A55.VB.A54,VB.A53,VB.A52, VB.A51,VB.A50  Y
VB.A49,VB.A48,VB.A47, VB.A46, VB.A45, VB.A44, VB.A43, VB.A42,
VB.A41, VB.A40,VB.A39, VB.A38, VB.A37,VB.A36,VB.A35,VB.A34
VB.A33,VB.A32,VB.A31, --down to VB.ACT)
```



```
:Action?   reply
   1.    Ninette,
   2.    Volunteers were used in many of the
   3.    schools featured in the video
   4.    module.  Particularly, Cupertino.
   5.    Also, contact Montgomery County
   6.    & Prince George's County Schools,
   7.    both in Maryland.
]cont
*Last line is 7.
 Reply will be sent to VB.A33
:cc?
 Subject:  VOLUNTEERS IN COMPUTER INSTRUCTION
:Subject? reply to volunteers
Mail sent to Oregon (VB.A33)
:Action? d
*All requested messages have been processed



+4721  THU 07/09/83 07:03 FROM VB.A46 ("Wyoming") "OREGON"
       VOLUNTEERS IN COMPUTER INSTRUCTION; 5 LINES

NINETTE - WYOMING KNOWS OF NO FORMAL VOLUNTEER PROGRAMS
FOR CHILDREN WITH COMPUTER - ALAN

To:  VB.A33
cc:  VB.ACT
```



```
251 Wed 11/10/82 15,06 From vb.a46
"wyoming",17 lines

How are colleges of education in each of
your states approaching microcomputer
training in pre-service programs.  Inter-
ested in names, addresses of contact
people who can answer questions such
as what level of computer literacy is or
should be expected?  are specific
courses required? budget allocations?
college role in inservice education?

To: vb.08
cc: vb.act
276 Tue. 11/22/82 09.48 from vb.a19
    "iowa": college preservation/
    inservice programs

Forwarding directory of contact
people for Iowa's teacher preparing
institutions. Persons named therein
can answer your questions regarding
preservice program literacy levels.
etc.

To: vb.a46
cc: vb.act
```

I. The BEST Electronic Information Network

Organizations, Groups and Individuals Involved

There are a number of electronic mail services (EMS) available for those who have access to a computer. A limited number of these services are targeted at educators. This includes services such as Special Net, EdNet, Bilingual Net, School Practices Information Network (SPIN) and School Practices Information File (SPIF).

BEST NET specifically was tailored to address the needs and concerns of key staff in state education agencies working together over a two year period to upgrade and strengthen their knowledge and expertise about new information technology and its applications to basic skills instruction. The system offered its users an opportunity to exchange ideas and request resources and materials from other users working with the new information technology and basic skills instruction. Messages could be answered on the system in the same electronic format in which they were sent.

Participating in the BEST NET effort were 41 state education agencies, the U.S. Department of Education, the Department's ten regional offices and a variety of public and private information resource centers involving professional educational associations in the areas of basic skills and educational technology, teaching and school administration, established educational data bases, school district practitioners and educational specialists (See Exhibit No. 2). As such, BEST NET became an "electronic highway" for gaining access to a variety of important groups, ideas and experience in the use of the new technology. The network's strength was derived both from the content it addressed and the types of organizations and groups who brought their vast

Exhibit 2--Users of BEST NET Electronic Mail System

Alabama
Alaska
California
Colorado
Connecticut
Delaware
District of Columbia
Florida
Georgia
Hawaii
Illinois
Indiana
Iowa
Kentucky
Massachussetts
Maryland
Maine
Michigan
Minnesota
Montana
Nebraska
New Hampshire
New Jersey
New York
North Dakota
Ohio
Oregon
Pennsylvania
Rhode Island
South Carolina
South Dakota
Tennessee
Texas
Utah
Vermont
Virginia
Washington
West Virginia
Wisconsin
Wyoming
Puerto Rico

- Ten U.S. Department of Education Regional Offices
- Council of Chief State School Officers
- U.S. Department of Education
- Maryland Instructional Television
- Applied Management Sciences
- Salt Lake City Public Schools
- Northwest Lab - Resources in Computer Education (RICE), School Practices Information Network (SPIN) and School Practices Information File (SPIF)
- EduTech
- Albuquerque Public Schools
- ERIC/IR (Syracuse)
- International Reading Association
- Cincinnati Public Schools
- Detroit Public Schools
- Houston Public Schools
- Northeast Regional Exhange (NEREX)
- National Council of Teachers of English
- Computer Using Educators
- National Council of Teachers of Mathematics
- Association for Educational Communications and Technology

knowledge and information resources to the network and made them available to all who requested assistance.

These groups and organizations assisted the project in meeting the needs of the State Departments of Education in a variety of ways. For example:

- The Urban School Superintendents Task Force involving Salt Lake City, Albuquerque, Cincinnati, Detroit and Houston, initiated and supported by NIE, was established to assess technology concerns in large urban school districts. They provided BEST NET users access to real life problems and concerns at the school/classroom level and also mutually supported their own task force in exploring the potential of the technology.

- The Northeast Regional Exchange (NEREX) works actively with the New England states in technology and other educational concerns. They continued their networking with each other through BEST NET bulletin boards.

- Resources in Computer Education (RICE) is a database system developed by the Northwest Regional Education Laboratory that offers searches and retrievals for microcomputer courseware packages and manufacturers. State Team users were entitled to three complimentary searches on RICE as part of their participation in Project BEST.

- The Educational Resources Information Clearinghouse (ERIC) at Syracuse provided each participating state BEST NET user with a diskette of current ERIC searches regarding the use of microcomputers and video-disc technology in education, teleconferencing, hardware and software evaluation and other timely topics as part of their participation in the project. ERIC also responded to direct user queries sent over BEST NET.

As network users, these groups responded directly to inquiries from participating states. Thus, the network did not amass information and knowledge at any one central place or depository, but rather "brokered" educational technology information seekers and information providers wherever they might be. BEST NET, therefore, became a resource distribution tool modeling a different approach to electronic information dissemination -- provided ideas and current practitioner experiences as opposed to the accessing of large formalized knowledge banks or access to people, ideas and current practitioner experiences as opposed to large formalized knowledge banks or databases. This encouraged BEST NET users to rely on the technical versatility of the technology for open communication that is more reminiscent of the candid "practitioner" information exchange around coffee time and social activities at conferences, meetings and workshops.

There were five major bulletin boards or topical information arrays available to BEST NET users. These bulletin boards were developed jointly by the Project BEST staff and participating BEST states to provide current practitioner information about topics, problems and issues being faced in using technologies, such as the microcomputer, for basic skills instruction in particular and education in general.

CONFER listed upcoming conferences, workshops and seminars being held around the country and the world related to the new information technology as well as teacher and administrator professional association meetings. The CONFER bulletin board was updated weekly with listings at least one to two months in advance of the specific conference.

From an information data bank and library of articles, books and other resources about computers, cable and videodisc technology and their application in education, Project BEST staff developed a bibliographic bulletin board of current readings known as BIBLIO. EduTech, a federally funded project aimed at investigating technology applications in special education, collaborated with us to provide data for the BIBLIO bulletin board. Every two weeks a particular subject area was identified, typically to support the topic surrounding an upcoming teleconference or one which had been cited as a topic of interest by Project BEST state teams. Available literature on the subject was searched, and articles were highlighted that had relevance to particular technology subject areas identified as important by Project BEST state sites. An illustrative BIBLIO topic is presented in the Appendix. Over the course of its existence, BIBLIO topics included the areas of computer literacy, uses of the microcomputer to teach reading and language arts, hardware and software evaluation and selection guidelines, getting started with microcomputers, and seeking funding support.

Prior to each of the five major video teleconferences, hosted by Project BEST for the 41 participating states, a bulletin board was set up to convey information about the activities of the teleconference and up-to-the minute details and requests in preparation for the event. Each Teleconference Bulletin Board was labeled by the date of the event, e.g. JAN 24 was the heading for the information board about the January 24 teleconference that originated in New Orleans. Likewise, MAY 18 was the heading for the electronic bulletin board supporting the May teleconference on computer literacy.

The NEWS bulletin board displayed current events and interesting tidbits of information about technology. The availabibity of a toll-free software hotline number was made known in this listing. Other interesting items included a student and teacher technology exchange program, computer camps and awards in technology applications in education, just to name a few.

The PROBMO bulletin board solicited exchange of ideas regarding a current concern or issue in applications of technology to education. Twice each month, a problem was posed by someone on the network dealing with applications with technology in education. Users responded to the problem by sending a comment to the Project BEST "mailbox". These comments were posted each working day.

Over a period of days, the set of responses to a particular problem that was posed could be organized and arrayed as an integrated set of solutions to or advice on a particular problem, and made available to others who at some later date might inquire about a similar situation. Thus current experience and information evolved to become a body of knowledge, advice and expertise for others.

A sixth Project BEST bulletin board known as SOFTIE (Software Information Exchange) was in the planning stages as of the writing of this paper. It is being designed for use in the last two months of Project BEST to collect comments and reactions to a microcomputer diskette developed by Project BEST staff in co-operation with CUE--Computer Using Educators--and several of the Project BEST school sites. The diskette contains a listing and description of the various pieces of microcomputer software, both administrative and instructional, commercially acquired and locally produced, being used by the eight school sites documented in the Project BEST video modules and district school case studies. The diskette and SOFTIE bulletin board are being used on a pilot basis to facilitate the exchange of software information and specific practitioner experience with particular pieces of microcomputer software.

BEST NET also permitted procedures such as Delphi polling among users; the giving and receiving of immediate feedback for requests that carry short deadlines requiring quick turn-around responses; and the need for multiple responses from a wide array of perspectives or sources. Finally, the BEST NET system, through the use of a software program known as EMS FOLIO also permitted computer network conferencing whereby various individuals could engage in an ongoing communication exchange without necessarily having to coincide with each other in terms of time, pace or space. It allows individuals to interact at their own rate to messages; and to respond at a convenient point and comfortable speed. It also means that individuals can join a communication process after it has started and not miss any portion of the communication because the interchange is stored in the computer and then later displayed on a monitor or printed instantaneously for review by others.

BEST NET in Comparison To Other EMS Systems

On September 30, 1983, BEST NET will officially complete its mission to provide educators at the State Education Agency level with functional "hands-on" experience (that is, experiences that relate to their current work needs or requirements as opposed to "demonstrations") in the use of an electronic information exchange service. However, several other types of on-going electronic networks currently are available to educators. These systems are quite similar to BEST NET in many respects, with four principal differences:

1. BEST NET heavily underscored the interactive feature of electronic mail systems. It derived its strength from the "peer-to-peer" exchange of current task-specific experiences and practices while they were still fresh in their minds, as opposed to the more conventional approach of accessing information amassed over a period of time and stored in a computerized data bank. That is, the information "within" people was given top priority; the information within the computer became secondary.

At the time BEST NET started, the microcomputer phenomenon in education was quite recent; there was neither an extensive knowledge or research base on the subject nor "authorities" or "experts". Rather, there were only some people with more experience than others. Consequently the exchange of knowledge derived from the current, specific experience of others made BEST NET and the people, groups and organizations on the network a valued resource. The system focused on the very immediate work needs and information requirements of its users.

2. BEST NET exclusively addressed the content area of the new information technology and its use in education at the K-12 levels, with particular emphasis on basic skills applications in math, reading and language arts.

The purpose of BEST NET was to provide assistance to state education agencies that would enhance their capacity to use the new information technology, in a variety of ways, as part of their own operations and services to schools. A basic project strategy, therefore, was to emphasize technology as a specific body of content and subject matter while using it in a functional way to transmit that knowledge and information to project participants. As such, BEST NET played the dual role of assisting states in their need to understand the "micro chip" revolution while simultaneously working to help schools deal with it.

3. BEST NET users represented virtually the "who's who" across the United States in terms of people, places and current information about schools, educators and new information technologies (see Exhibit 2).

BEST NET users acted as "givers" as well as "takers" of information. The varying degrees of experience with the new technology that each user brought to the network and/or acquired over the operating time span of the effort allowed users to learn from each other and to seek out each other as resources or "experts". BEST NET therefore became one of the channels or linkages in which project participants exercised control over the structure and content of the requisite information and knowledge for problem-solving communications.

4. Other EMS systems have been developed for specific interest groups such as special education practitioners, school administrators, university officials, state legislators, or bilingual educators and specialized networks. For example, Special Net (for special education administrators) was formed to provide topical information of interest to a particular group.

BEST NET, on the other hand, did not create a new network of people, places or organizations, but built on networks already in place (e.g., professional education associations, school districts, specialists, state education officials) who had both a need and reason for "keeping in touch". BEST NET provided them with the opportunity to communicate and to learn from it.

Commercial systems such as the Source or CompuServe are nationwide networks that provide a wide variety of information for thousands of users. Like BEST NET, these electronic communication networks vary in the information they offer, but they do have two features in common:

- the ability to provide varying types of information exchange services.

- the retrieval and arraying of information in different formats (e.g., bulletin boards or databases) depending on user preferences and needs.

In a recent paper on the subject prepared by Sharon Lee Raimondi, entitled Electronic Communication Networks,[3] some helpful comparative data is provided that notes similarities and differences of EMS systems and underscores the premises and strategies of BEST NET. According to Raimondi, an electric communication system is most effective as a tool to gather information when human contact is not necessary. The Project BEST experience with its own BEST NET suggests that the system is most effective when used by those individuals with prior face-to-face contact with each other and/or long-standing personal and professional contact. This association creates a network of individuals with higher levels of trust and willingness to exchange the type of information most practitioners find vitally useful.

Raimondi advises users to select a network that will meet their specific needs. This can be difficult because there are many networks to choose from. Exhibit 3 from Raimondi's research provides an overview of some networks designed for business and home use. Information for each network includes the network name, target audience, features, number of users, subscription rates and connect charges. Each network has many features, but for comparison purposes, Raimondi has grouped them into four broad categories: electronic mail, bulletin boards, databases and computer conferencing--that is, the capability of a network to allow communication among a group of people for a specific purpose. Exhibit 4 lists the relevant information for BEST NET in a format similar to that of Raimondi's Exhibit 3.

---

[3] Raimondi, Sharon Lee. Electronic Communication Networks. Occasional paper produced for Project EduTech, JWK International, Annandale, Virginia; 1983

Summary

As configured during the period of August 1, 1982 through September 30, 1983, BEST NET underscored the "People-to People" self-help approach of Project BEST by bringing people together on a daily or weekly basis with the aid of an electronic message system. Through the use of this technological tool, timely and first hand information was exchanged that facilitated the handling of critical problems, often within a matter of minutes.

The use of BEST NET has been limited only by available resources, time and the user's imagination.

The implications of BEST NET for technical assistance and information dissemination and exchange functions are myriad, as evidenced by the functional experience with this technology that BEST NET has provided state education agencies during the course of it 14 months of existence. Through the use of reserved telephone lines connected to a series of designated computer terminals and/or microcomputers plus ancillary printing and video display equipment, information of varying lengths--from one or two words to several pages covering a range of issues, concerns and work activities--was accessed and exchanged over long distances in a fraction of minutes. Time, resources and energies were thereby optimized. The manner in and the extent to which this occurred is discussed in the next section of this report. Specific data on the characteristics and patterns of use are reported and analyzed in terms of the overall impact of the States' functional experience with BEST NET.

EXHIBIT 3. -- Comparative Characteristics of EM Systems

NETWORK	TARGET AUDIENCE	FEATURES	NUMBER OF USERS	SUBSCRIPTION RATES[1]	CONNECT CHARGE[2]
ecNet National Clearinghouse for Bilingual Education 1555 Wilson Boulevard Suite 605 Rosslyn, VA 22201 (703) 522-0710	bilingual educators	electronic mail bulletin boards databases	50	free (part of BRS)	$10.00 $16-35[2] (data base)
Computer-Based Message System For Vocational Educators The Ohio State University 1960 Kenny Road Columbus, OH 43210 (800) 848-4815 or (614) 486-3655	vocational educators	electronic mail bulletin boards	50	free - encouraged to join SPIN	$18.00
DCI-DeafNet Deaf Communications Institute 75 Bethany Hill Framington, MA 01701 (617) 875-3617 (voice) (617) 875-0354 (TTY)	hearing impaired individuals	electronic mail bulletin boards	165	$10.00 - $100.00 one time fee	$ 4.00 - $14.00
Educator News & Information Network National School Public Relations Association 1801 North Moore Street Arlington, VA 22209 (703) 528-5840	general educators	electronic mail bulletin boards databases	not available	$175.00 year	$ 5.75 - $20.75
Electronic Information Exchange System New Jersey Institute of Technology 323 High Street Newark, NJ 07102 (201) 645-5503	educators researchers business	electronic mail computer conferencing databases	1,200	$75.00 month	$ 7.00 - $ 9.50
School Practices Information Network (SPIN) Bibliographic Retrieval Services 1200 Route 7 Latham, NY 12110 (518) 783-1161	regular educators	electronic mail bulletin boards databases	300	$150.00 one time fee	$18.00[2]
SpecialNet National Assn. of State Dirs. of Special Education 1201 16th Street, N.W. Suite 404E Washington, DC (202) 822-7933	general educators special educators	electronic mail bulletin boards databases	1,200	$200.00 year	$ 4.00 - $18.00
CompuServe 5000 Arlington Center Blvd. Columbus, OH 43220 (614) 457-8600	business consumers	electronic mail bulletin boards computer conferencing databases	50,000	$19.95 - $39.95	$ 5.00 - $35.00
The Source Source Telecomputing Corporation 1616 Anderson Road McLean, VA 22102 (703) 821-6660	business home use	electronic mail bulletin boards computer conferencing databases	32,000	$100 one time fee	$ 7.75 - $44.75

[1] Per hour costs

[2] Does not include royalties, telecommunication charges, off line printing, and mailing charges.

EXHIBIT 4. - - Characteristics of BEST NET EMS.

NETWORK	TARGET AUDIENCE	FEATURES	NUMBER OF USERS	SUBSCRIPTION RATES	CONNECT CHARGE
B.E.S.T. NET Project BEST Association for Educational Communications and Technology (AECT) 1126 16th Street, N.W. Washington, D.C. 20036 (202) 466-3361	•Education specialists, officials and policy-makers at the State Education Agency level •Project BEST Advisory Board organizations involving major U.S. education professional associations •Regional and Central offices, Department of Education staff •Selected school district sites	•Unique Configuration of Network Users •Electronic Mail •Bulletin Boards •Delphi/Polling •Conferencing •People's current experiences •Use of established data bases operated by individual network users.	• 70 Educational Organizations, Groups, or Agencies involving an estimated 1,500 individuals	• Available to Participating States and Department of Education Officials under Project BEST contract funds • Total expense per user site/mailbox costed at $750 for life of Project (Oct-1981-Sept. 30, 1983)	•$14.00 per hour •Advanced deposit of about $550 per mailbox 1

1 Per hours costs
2 Does not include royalties, telecommunication charges, off line printing, and mailing charges

II. BEST NET: ANALYSIS OF SYSTEM USE AND OPERATION

An Electronic Message Exchange system allows users to communicate and exchange ideas on general topics or common problems at their own pace and at a convenient time.

This section describes the technical operation of the BEST NET EMS, its users, and the ways in which they utilized the system to seek out or respond to requests for information. The uses made of BEST NET varied from state to state and from user to user, as indicated by the exhibits and discussion that follow. In general, a concerted effort was made by participants to monitor the electronic mail system and to share concerns and experiences via this electronic network.

Characteristics of System Users

State team leaders, designated by each State Commissioner of Education, were the principal users of the BEST NET system. These individuals at each of the 41 participating State Departments of Education included media specialists, curriculum specialists, instructional technologists and dissemination specialists. In addition to State Department of Education staff, the various resource organizations on BEST NET represented educators at the local school district level, university personnel, federal employees, software reviewers, regional education service programs and other individuals whose work involves a strong technology focus.

In most instances, the state team leader was the primary monitor of BEST NET. In some cases, however, another individual within the state department (technology or computer specialist , secretary, library or media specialist or another member of the state team) was assigned to monitor the system on routine basis. As Exhibit 2 (p.3) shows, an estimated 70 user organizations, groups and agencies formed the BEST NET user system involving an estimated 1500 individuals.

Usefulness and Impact of the System

The electronic mail system was designed to address several areas of concern. Participants could use the system to:

1. Stay current withupcoming activities and timely news dealing with the various technologies and their applications in education;
2. Collect bibliographies that could be referenced and shared with colleagues;
3. Inquire and respond to inquiries of concern regarding state education agency matters--both project and non-project related;
4. Develop a level of "hands-on" competence with computers.

Bulletin boards were updated several times per month depending on the topic. Users sent and received messages at any time, either through distribution listd (messages sent to a group of users) or directly to an individual user. New information could thus be generated daily to create the sense of a "living network" of users.

Illustrative Uses

A number of topics were selected for the various bulletin boards. Special activities on conferences running over extended periods were highlighted in the conference bulletin board. Bibliographic citations included such topics as videodisc technology, audio teleconferencing, computer literacy technology and personnel development, funding sources, getting started, technology in English and reading, applications of technology in basic skills instruction, and cable television. The "news" bulletin board varied from information about family and educator computer camps to notices about the availability of of free software.

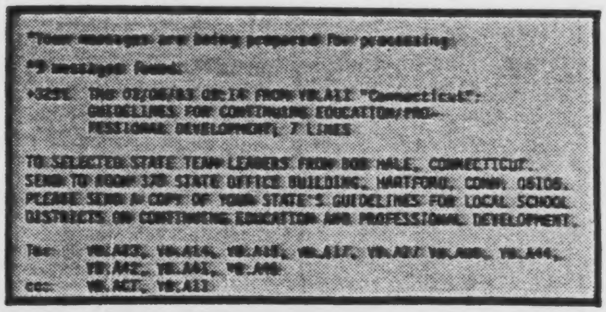
The most widely used of the various features was electronic "messaging". Several states were actively involved in the exchange of ideas and materials in order to complete tasks at their respecitve state education agencies. Many states queried users about the implementation of computer technology in the schools. Inquiries included the definition of computer literacy, requirements for computer education, teacher certification, state plans for implementation, surveys of microcomputers in the schools, directories of software--public and commercial, software/hardware evaluation instruments, hardware specifications, suggestions for selection criteria, and state policies and guidelines on a number of state policies and guidelines on a number of issues. A sample of the subjects of inquiries is presented in Exhibit 5.

Responses to inquiries via electronic mail were usually received within one or two weeks. Responses to requests made on BEST NET, but received via postal services, took longer because respondents had to locate the requested information or document. Many of the requests were answered via postal services because of content length (state plans, policies, etc.). See Exhibit 6.

EXHIBIT 5. -- Selected BEST NET Inquiries

	STATE
COMPUTER HARDWARE	
• BMC Monitor	IA
• Which brands of computer to use with AIT project	ME
• Apple Networking Systems	TN
• Network software adapters	TN
OTHER TECHNOLOGIES	
• Innovative uses of cable by local schools	CT
COMPUTER LITERACY (CL)	
• High School graduation requirements	CT
• Courses (content) developed in guidelines, goals, Ojectives,,models	DC,SD,TN,VA
• Parental input	OR
• Community College CBI programs, software, development support at the Community College Level	MD
• Teacher endorsement for computer science	MT
• Example of CL tests	MT
• Definitions of CL	TN, VA
DISSEMINATION	
• What states are doing with regional educational service to produce curriculum bulletins for distribution to local centers.	CT
PROFESSIONAL DEVELOPMENT IN COMPUTER INSTRUCTION	
• Guidelines for local school districts on continuing education and professional development.	CT
SEA	
• Statewide plan for coordination of technology for all levels	CT,VT,WI
• State Basic Skills plan	CT
• State & local relations in policy information	MD
• Micro lab or examination center for hard/software state evaluation and review	WI
• Experience in using mainframes and micros	
• Resources - materials, projects, people resources available regarding instructional application of micros in reading and writing	WI
SOFTWARE	
• List of micro programs in public domain	CT
• Management software used by other states	DC
• Software for diesel engines	IA
• Freeloader 500 software	MN
• Similarities in use of micros as in state book adoption process	OR
• Instructional programs to meet needs of migrant children and for migrant students	WA
• Guidelines for software exchange	VT

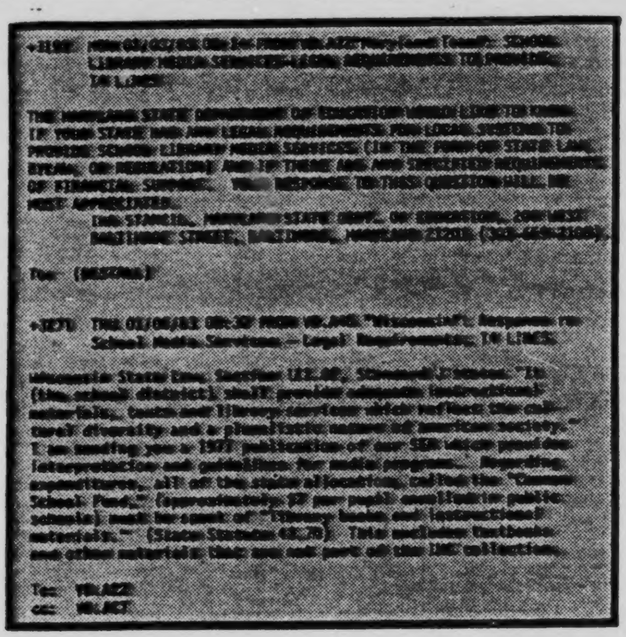
EXHIBIT 6. -- Example of BEST NET Message Requiring Postal Service Response



```
*Your messages are being prepared for processing:

*9 messages found:

+[illegible]  THU 03/08/83 08:14 FROM VB.A11 "Connecticut";
       GUIDELINES FOR CONTINUING EDUCATION/PRO-
       FESSIONAL DEVELOPMENT; 7 LINES

TO SELECTED STATE TEAM LEADERS FROM BOB HALE, CONNECTICUT.
SEND TO ROOM 370 STATE OFFICE BUILDING, HARTFORD, CONN. 06106.
PLEASE SEND A COPY OF YOUR STATE'S GUIDELINES FOR LOCAL SCHOOL
DISTRICTS ON CONTINUING EDUCATION AND PROFESSIONAL DEVELOPMENT.

To:    [illegible]
       [illegible]
cc:    [illegible]
```

In one case, however, appropriate portions of legislation were cited on BEST NET in response to an inquiry. See Exhibit 7.

EXHIBIT 7. -- Example of Legislative Segment



Electronic messaging offers flexibility in the exchange of information. In an "urgent EMS poll," a rank ordering of topics was requested by Project BEST staff. The result was an array of responses presented in a manner that was easily manipulated by the individual users. See Exhibit 8.

One state posted a questionnaire on the electronic mail system and asked users to respond to the questionnaire as well as evaluate its usefulness. See Exhibit 9.

EXHIBIT 8.-- Rank Ordering of Topics Requested

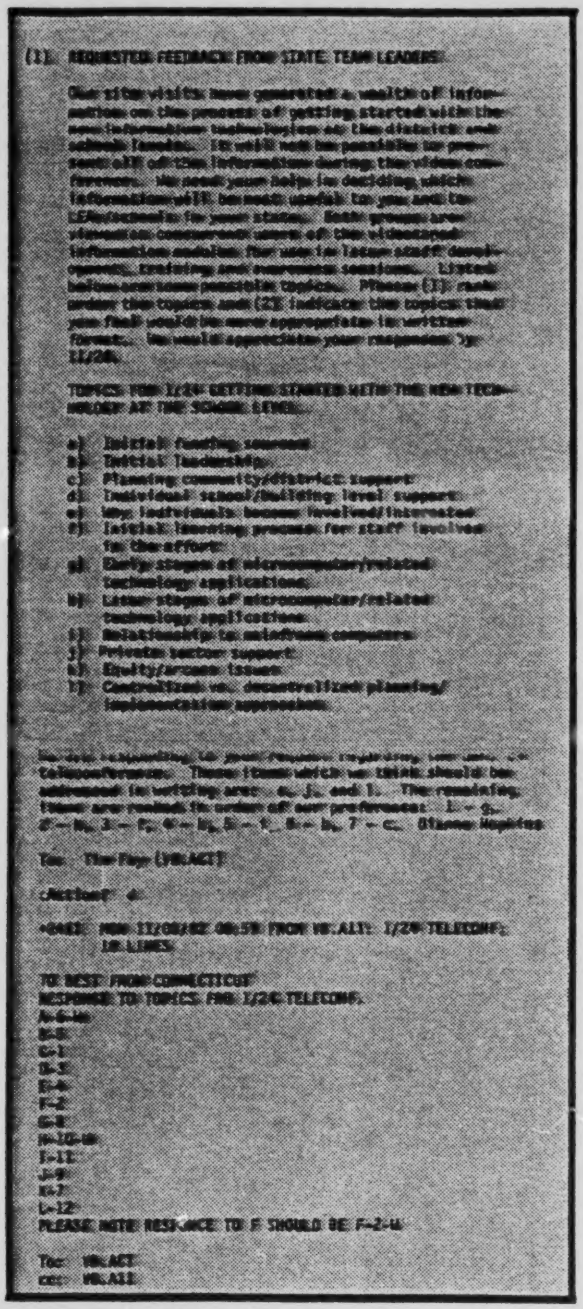
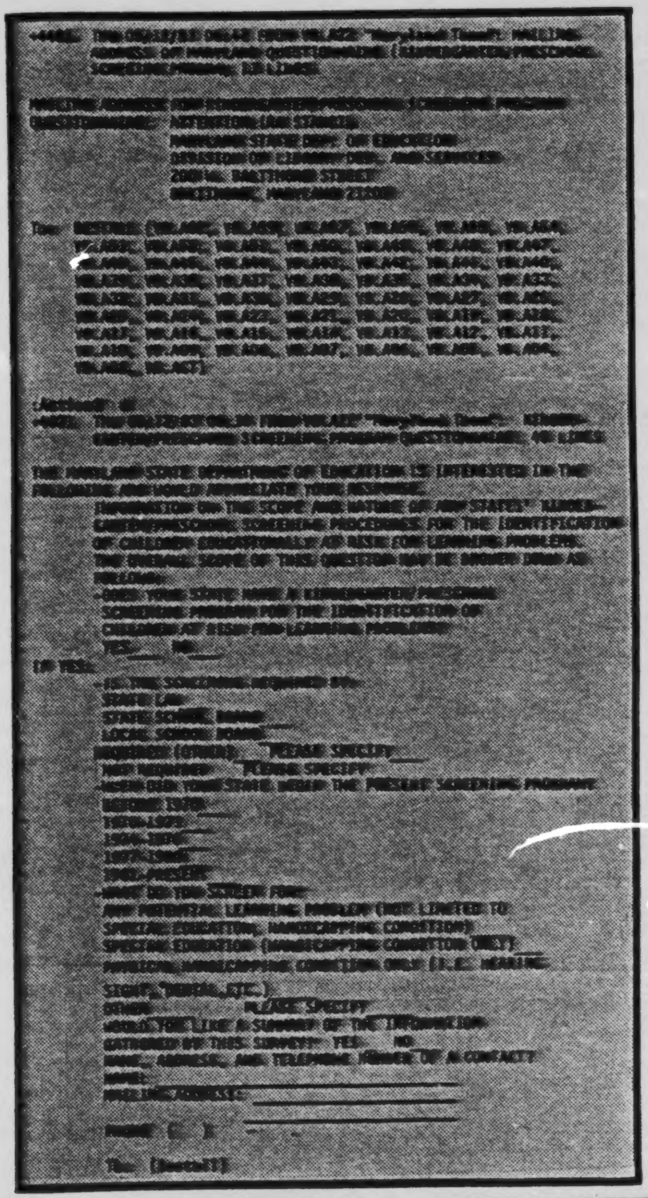


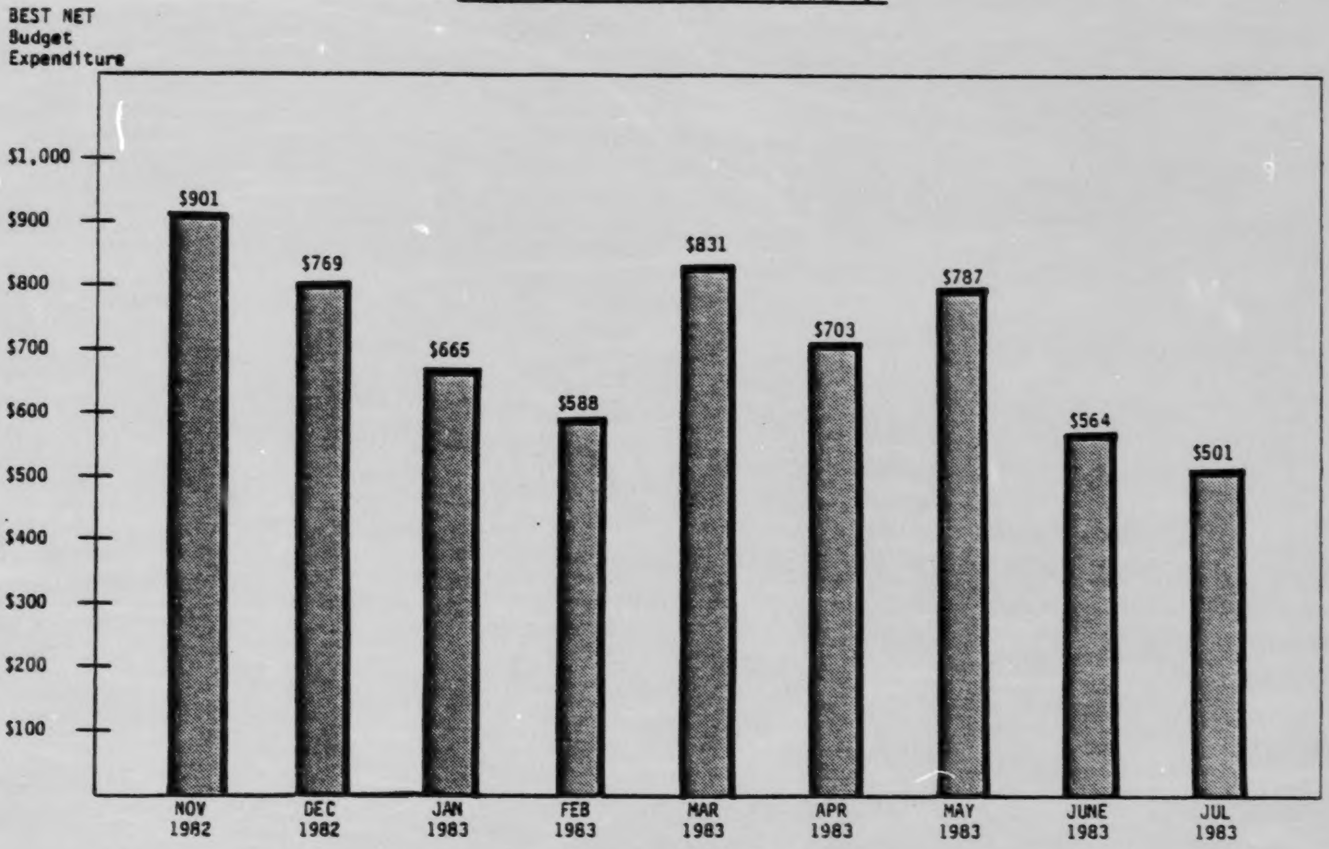
EXHIBIT 9. -- Example of a BEST NET Questionnaire Response



219

EXHIBIT 11

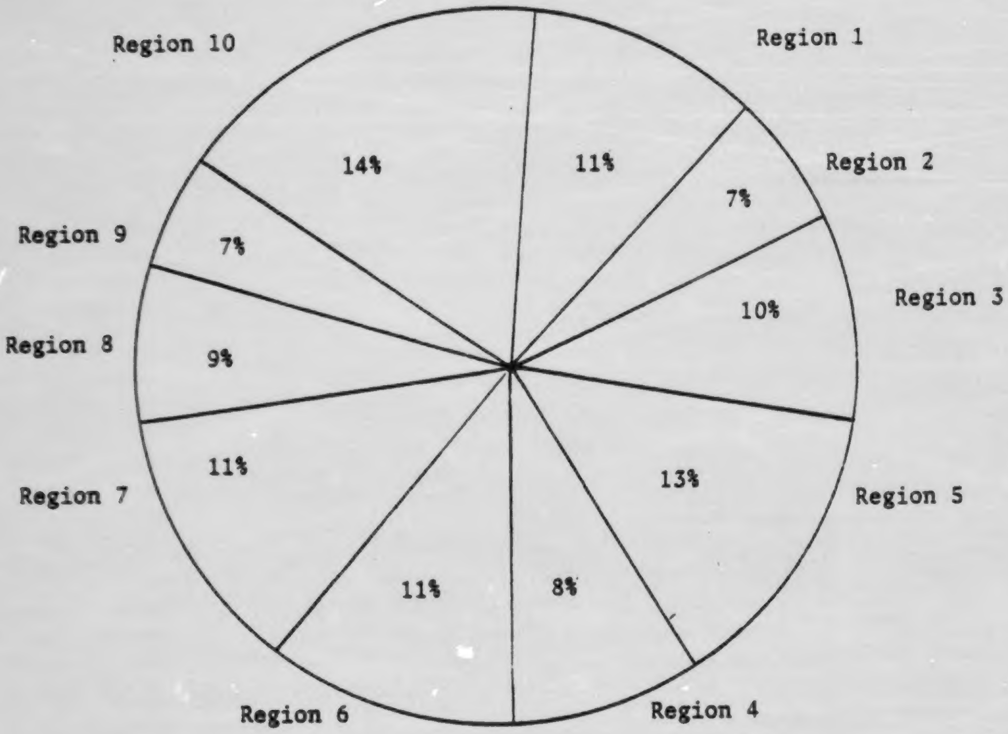
Monthly Use of BEST NET by Budget Expenditure (State Accounts Only)



* Includes monthly maintenance charge per mailbox assessed by Stanford University computer facility.

EXHIBIT 12

BEST NET Use by Geographical Region*



LEGEND

Region 1: Rhode Island, Connecticut, Massachusetts, Maine, Vermont, New Hampshire**
Region 2: New York, New Jersey, Puerto Rico**
Region 3: District of Columbia, Maryland, West Virginia, Virginia Pennsylvania, Delaware**
Region 4: Tennessee, Georgia, Alabama, Florida, Kentucky**, South Carolina
Region 5: Illinois, Wisconsin, Indiana, Ohio, Minnesota, Michigan
Region 6: Texas
Region 7: Iowa, Nebraska
Region 8: Wyoming, Utah, Montana, South Dakota, North Dakota, Colorado
Region 9: California, Hawaii**
Region 10: Alaska, Washington, Oregon

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* Total exceeds 100% due to "rounding-off of percentage figures.
**States that did not acquire the requisite hardware and/or software to access BEST NET

Patterns of Use

Most active users said they accessed the electronic mail system at least once per week (some daily or twice per week); others used the system once or twice every two weeks. A list of the state users is presented in Exhibit 10, which includes each state ranked from highest to lowest use, and includes regional and group affiliation as explained below. Unfortunately, many of the stated did not acquire the necessary hardware or software required to access the network. This accounts for those states ranked 35 and below in Exhibit 10.

Exhibit 11 charts the monthly use of the electronic mail system. Substantial use of the system was noticed during earlier stages of implementation. The announcement of BEST NET was made during a training and awareness workshop for the state team leaders in May 1982. It is surmised that the excitement of logging on and the novelty of using an electronic message system (a first time event for many participants) led to the enthusiasm that resulted in a high frequency of use during the initial months of operation. Although a steady decline is evident, a consistent group of users continued to check their messages, review updated bulletin boards and pose inquiries. Similar trends were reported by the state team leader in Alaska when that state implemented an electronic mail system.

During the course of the project, participating states were categorized by geographic location and size of student enrollment. In the project's effort to broker existing networks, the Department of Education's regional offices were invited to participate in Project BEST and to become users of BEST NET on an experimental basis. Exhibit 12 displays the activity on the network by region. States in the western and central portions of the country tended to be more active users, followed by the New England states.

The 41 participating state sites were rank ordered by size of student enrollment (public, K-12) and placed in four groups. Group 1 represented the larger school enrollments and Group 4 represented states with small student populations. Minor differences were noted between the various groups as indicated in Exhibit 13. Group 2, which is composed of several central and western states, ranks highest in the overall use of the electronic mail by student enrollment.

It is difficult to accurately compare the activity of the information resource organizations that formed part of the network because most of them joined well after August 1982 and several accessed the system after January 1983. Exhibit 14 reflects this variation.

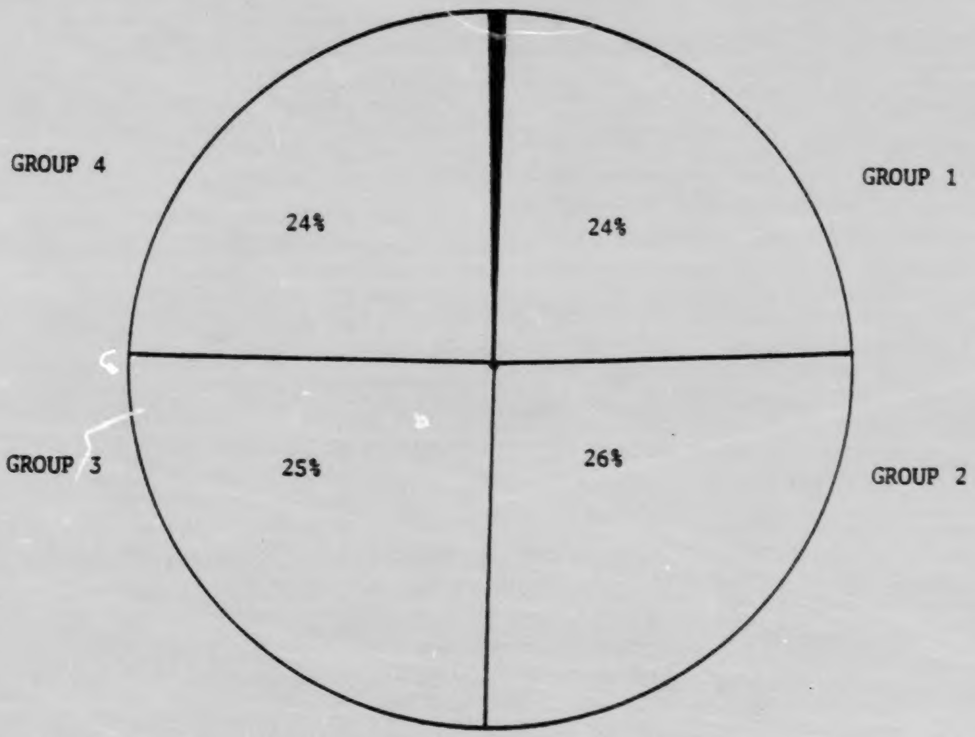
EXHIBIT 10. -- Ranking of Electronic Mail Usage by State

RANK	STATE	BEST NET ACCOUNT	GROUP MEMBERSHIP *	GEOGRAPHICAL REGION **
1	CT	(11)	3	1
2	AK	(08)	4	10
3	IL	(17)	1	5
4	WI	(45)	2	5
5	DC	(13)	4	3
6	IN	(18)	2	5
7	MD	(22)	2	3
8	WY	(46)	4	8
9	TN	(37)	2	4
10	WA	(43)	2	10
11	OH	(32)	1	5
12	IA	(19)	3	7
13	MA	(23)	2	1
14	ME	(21)	3	1
15	UT	(40)	3	8
16	GA	(15)	1	4
17	WV	(44)	3	3
18	TX	(39)	1	6
19	MN	(25)	2	5
20	VT	(41)	4	1
21	MT	(26)	4	8
22	CA	(09)	1	9
23	NY	(30)	1	2
24	NJ	(29)	1	2
25	NB	(27)	3	7
26	OR	(33)	3	10
27	VA	(42)	2	3
28	AL	(07)	2	4
29	SD	(36)	4	8
30	FL	(14)	1	4
31	PA	(38)	1	3
32	ND	(31)	4	8
33	RI	(34)	4	1
34	CO	(10)	3	8
35	MI	(24)	1	5
36	HI	(16)	4	9
37	KY	(20)	2	4
38	DE	(12)	4	3
39	NH	(28)	3	1
40	SC	(35)	2	4
41	PR	(01)	3	2

*School enrollment. See Legend, Exhibit 13.
**Regional offices. See Legend, Exhibit 12.

EXHIBIT 13

BEST NET Use by State Student Enrollment Data*



LEGEND

GROUP 1: California, Florida, Georgia, Illinois, Michigan, New Jersey, New York, Ohio, Pennsylvania, Texas

GROUP 2: Alabama, Indiana, Kentucky**, Maryland, Minnesota, South Carolina**, Tennessee, Virginia, Washington, Wisconsin

GROUP 3: Colorado, Connecticut, Iowa, Maine, Nebraska, New Hampshire**, Oregon, Puerto Rico**, Utah, West Virginia

GROUP 4: Alaska, Delaware**, District of Columbia, Hawaii**, Montana, North Dakota, South Dakota, Vermont, Wyoming

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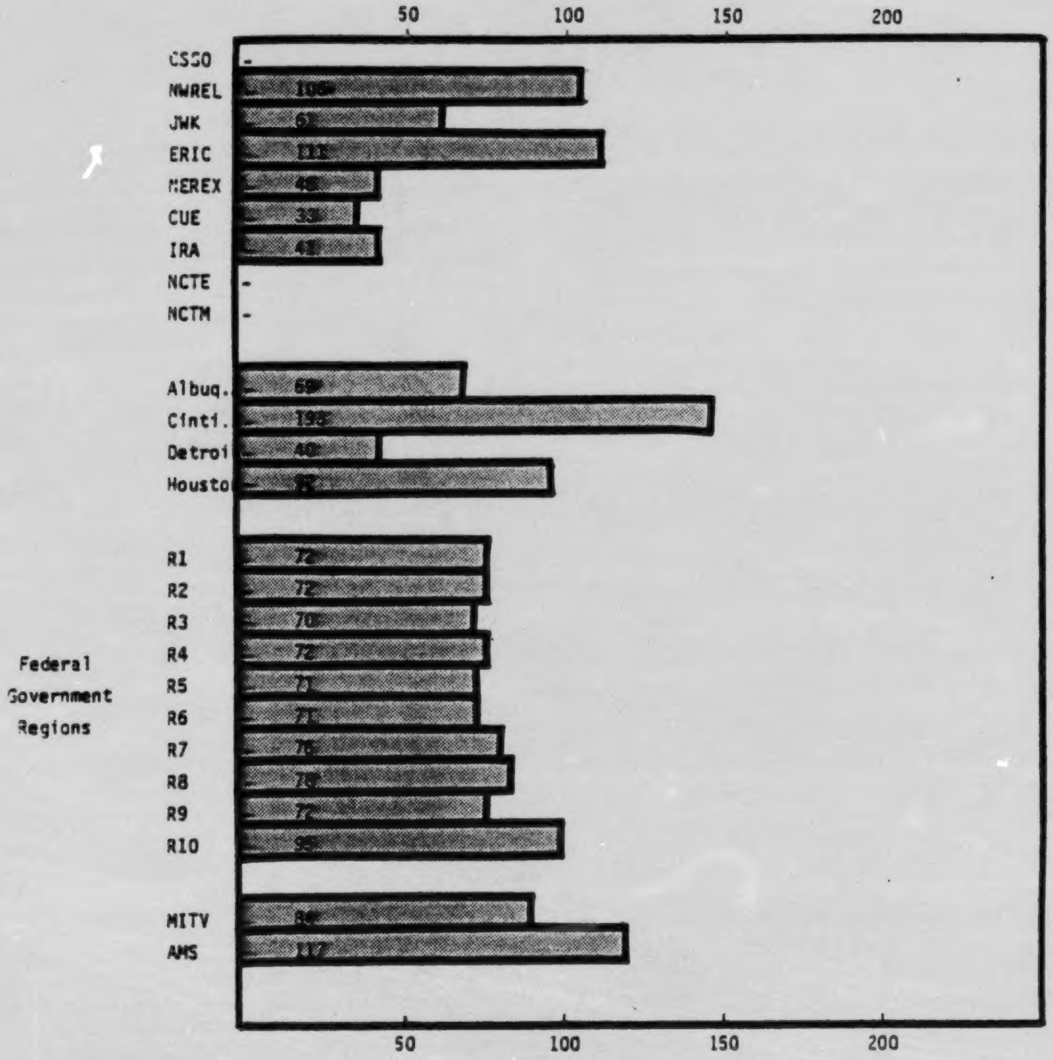
*Estimates do not total 100% due to "rounding-off" of percentage figures.

**States that did not acquire the requisite hardware and/or software to access BEST NET.

EXHIBIT 14

BEST NET Use by Participating Resource Organization

Budget Dollar Expenditures



Operation and Maintenance

An investigation of available electronic mail services was conducted during the early months of the project. The Stanford University Center for Information and Technology was selected because it offered a flexible electronic mail system with minimal on-line charges.

Initiating the System

It was necessary to reprogram and reformat Stanford's electronic mail system to develop a network that could easily be accessed, given the fact that a large number of BEST NET users either had never used a communications system or had never operated a computer. Each bulletin board space was programmed, log-on procedures simplified, new command codes created, and special text files maintained for updating the various bulletin boards and greeting protocols particular to the BEST NET system. A user manual[3] was developed that presented step by step procedures for logging on, reading and sending messages and reviewing the various bulletin boards. Fifteen distribution lists were devised to facilitate the delivery of information to select groups of individuals on the network as opposed to sending messages to the entire audience. "BESTALL" for example indicated that all users of the system would receive a message; "group1" indicated that only the states in that group (largest school enrollment) would receive a given message.

Inputting and Updating the System

In an effort to provide current information and news that was relevent to the needs and interests of the various users of BEST NET, a schedule for monitoring the system and updating the various bulletin boards was designed. The BEST NET system was monitored at least once each day (on the average) by Project staff. Responses to inquiries were handled typically within one week of request, usually on the same day, depending on the amount of research involved. When information was not readily available, the request was acknowledged with a message that additional follow-up was required.

A total of eight bulletin boards were available to BEST NET users during the course of the Project. Exhibit 15 summarizes the information contained in each bulletin board and the schedule for updating it. As indicated in this exhibit, coordinating the system was a staff-intensive effort requiring a fulltime responsibility given the amount of time necessary to research and document information, monitor the electronic mail budget, troubleshoot system problems, and evaluate system use; and a part-time responsibility was essential to maintain the library of available documents, periodicals and other resources that supported the system.

Budget

Under the U.S. Department of Education contract, each state account holder was permitted approximately 40 hours of service, defrayed through the Project's budget for the duration of the project. The total cost of $760.00 per mailbox included the maintenance charges assessed by Stanford, all on-line costs, the development and distribution of the users manual and manual updates and a percentage of Project BEST staff time to facilitate the information exchange process. The budget was monitored weekly and as accounts reached the initial budget allotment, incremental increases were made. This method was used to remind users to make careful and frugal use of the system and not to consume their entire budget allotment during the early stages of implementation. Requests for account budget increases were made via BEST NET in a matter of minutes by sending a message to Stanford University's accounting liaison. Typically,

[redacted]

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[4] BEST NET: The Electronic Mail System User Manual. AECT/Project BEST, Washington, DC, 20036 July 1983. Copy submitted to ERIC/IR Syracuse for inclusion in CIJE/RIE.

accounts were increased within the hour. Occasionally, Stanford would send a letter indicating that the user had exceeded the budget allotment. By the time the letter reached the user and the BEST office, however, the account had been increased via the EMS. Thus, users were instructed to disregard printed budget notices from Stanford since all such matters were handled directly by the Project BEST office.

Other BEST Products Prompted by EMS.

Through the various resource organizations participating in the electronic network, a number of microcomputer diskettes were developed to strengthen the various information dissemination efforts. For example, as part of its membership with BEST NET, ERIC/IR at Syracuse University developed from its extensive database an educational technology, a series of microcomputer diskettes dealing with and complementing the topics of the Project BEST teleconferences:

- Computer literacy
- Software/Hardware Selection and evaluation
- Applications of the Microcomputer in Education

Each participating Project BEST state received the ERIC microsearch program and above-referenced diskettes.

Secondly, in cooperation with the California-based Computer-Using-Educators (another BEST NET user),the eight school districts[5] we selected in developing our video modules of practitioner experience, the District of Columbia and Puerto Rico (also BEST NET users), the Project BEST staff is developing a Software Information Exchange diskette known as SOFTIE. A comprehensive list of software currently being used by these school districts will be arranged on a diskette and distributed to each participating district. The EMS will facilitate: 1) the exchange of ideas about the diskette and its contents and 2) the ability to update entries. Exhibit 16 provides a description of these information products. A sample SOFTIE entry is presented in the Appendix.

Evaluation

Each month all Project BEST information services, including the electronic mail system, were evaluated. All BEST NET correspondence and updates of bulletin boards and requests for information via telephone and postal services were documented and then tallied and analyzed at the end of the month. Correspondence by specific states was also noted. However, BEST was not privy to all correspondence on the EMS. Unless the "cc BEST" or "cc vb.act" command was used when messages were transmitted from one user to select users, the BEST staff would not be notified. We encouraged the use of the "cc" command when messages were sent to individual users.

In general, the analysis suggested that the general public made more requests for information about BEST NET than any other single component of Project BEST. Project staff response time to these queries improved as the project progressed due to the coordination and diligence of the information services staff.

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[5] Fairfax, Va; Cupertino, CA; Albany, OH; Cincinnati, OH; Ann Arbor, MI; Plains, MT; Wayne, NJ; Ft. Madison, IA.

Exhibit 15

Description of BEST NET Bulletin Boards

TITLE	TYPE OF INFORMATION	REGULARITY OF UPDATE	SOURCE(s) OF INFORMATION	HOUR(s) TO UPDATE*
BIBLIO	Bibliographic citations	Bi-weekly	Journals, Meetings, EduTech Documents	2
CONFER	Calendar of conferences, seminars, workshops	Weekly	Journals, Staff meetings, professional contacts	3
NEWS	General Information	twice weekly	Journals, Dept. of Ed. State participants, Newspapers, Professional contacts	4
OCT 28; JAN 24; MAY 18; JUN 30;	Teleconference logistics	as necessary (1-2 per week)	Staff, Project Participants	2 each
PROBMO	Concerns and special issues	monthly/ twice per month	Staff, Project Participants, Researchers.	2

*Per Month; Approximately sixty person-hours per month was required to maintain the Library files and research available sources. This estimate does not include the initial set up of the system.

EXHIBIT 16

BEST NET User Software Products*

TITLE	TYPE OF INFORMATION	SOURCE(s) OF INFORMATION
ERIC Diskette on Computer Literacy	Bibliographic citations dealing with the subject of Computer literacy in education	ERIC/IR staff at Syracuse University and Project BEST from CIJE and RIE
ERIC Diskette on Hardware/Software Evaluation and Selection	Bibliographic citations dealing with the selection, evaluation and acquisition of hardware and and software for educational purposes.	ERIC/IR staff at Syracuse University and Project BEST from CIJE and RICE
ERIC Diskette on Classroom Applications	Bibliographic citations dealing with applications of the use of computers in education	ERIC/IR staff at Syracuse University and Project BEST from CIJE and RICE
SOFTIE Diskette	List of software currently used by participating Project BEST school districts, arrayed by subject area	Project BEST, Computers Using Educators and participating BEST school sites (see Exhibit 15 for names of school districts).

*ERIC diskettes will run on the Apple IIe, II+, III with the Emulator, and the Franklin ACE 1000. SOFTIE was developed for the Apple IIe with plans for compatibility with other brands.

III. LESSONS LEARNED

As we look back at our two-year experience with the planning, implementation and operation of BEST NET we find it helpful to put it in the context of our original intentions. Project BEST was to provide initial, and functional, experiences with three telecommunications technologies that had potential for education. They included teleconferencing (both video and audio), videotape and electronic mail. Of the three, electronic mail (BEST NET) was least familiar. Few, if any, new behaviors were necessary to use video or audio teleconferencing; prior experiences with telephones conditioned us about what to expect. But except for those of us who had experience with computer terminals or word processors, BEST NET was an initial experience.

What was that experience like--for state teams and for project staff? From both voluntary and solicited feedback, we have developed a generalized picture of initial experiences that are quite similar to those reported in the literature from initial business and industry use of electronic mail. How do these reactions compare to yours?

- It's nice to have access to up-to-date information about a subject like microcomputers where everything changes so rapidly. It helps relieve that feeling of being left behind.
- It's also helpful to have the information in a format where you can choose what to read. It's like scanning all the headlines in the morning paper, but only reading the one or two articles that interest you.
- It's hard not to feel strange and inadequate the first few times at the terminal. No two terminals work alike so there is a good chance that the instructions from the EMS operators won't really be appropriate for your machine.
- It takes time to get used to the informal nature of the system so that it feels okay to leave in typos and other glitches.
- It's disappointing when it takes so long to get responses to a general request we put on the system...yet we only check the machine once a week ourselves.
- We feel guilty that we didn't use it more, or used it less at time went on. It's like explaining to a relative that their gift is nice, but you don't need to use it everyday.
- If it had been here in my office I would have used it more. There were times when I could have checked it but didn't feel like going to another part of the agency to do it.
- We used a microcomputer without a printer at first. I feel much more secure now that I can have a hard copy of everything.
- I was excited by the number of responses I got from a general request, especially from states I never thought were doing anything in this area.
- We feel like we've taken more than we've given. When a request isn't addressed to you specifically it takes more motivation to respond.
- It's easier for me to use it because I've met most of the team leaders. A lot of people in the office are un-

comfortable because they don't know who they're talking to.

- We're enthusiastic about the electronic mail concept, but we've stopped using it because we're too busy with other things now.

- I didn't spend as much time with it as I should have, but I spent as much as I could have.

To the extent that these snapshots of feelings represent common experience during initial use of electronic mail systems, what have we learned from them as operators of an EMS, as users, and what from our Project BEST vantage point, have learned as developers of an EMS?

The following guidelines are presented not as indelible rules, but only as stepping stones to help us all find our way into the "information age".

Guidelines for EMS OPERATORS

- Assure your own continuing access to new information.

Electronic Mail Systems (EMS) are hungry beasts. Electronic bulletin boards lose their advantages if they are not kept current and comprehensive To do this requires access to a wide range of related information resources ---a requirement that is even more complex if you are bridging more than one professional interest area.

BEST NET and other EMS systems have dealt with this need in two ways.

1) The operating organization can subscribe to all major or minor publications in a field, and request placement on mailing lists for announcements, etc. When this material is received it has to be screened and appropriately deployed.

2) Bulletin boards can be "farmed-out" to organizations that would have access already to the needed information because of the nature of their work. There are usually reciprocal benefits to such an arrangement; e.g., the organization maintaining the bulletin board gains publicity about its services.

- Keep Bulletin Boards current

The frequency that a user checks a bulletin board is related to the frequency of its updating. If users continually find "old" previously read information, they will check less often.

Project BEST addressed this by listing bulletin board information in reverse chronological order and by including a date code with each item. This provided clarity; when a user accessed a bulletin board, new items were displayed first and by checking date codes the user could tell what information was recently added. See Appendices A,C and D.

- Stay alert for ways to improve the system

User feedback is a critical component in the implementation of a technology as new as electronic mail. Methods must be built in to facilitate this feedback. Because of the nature of Project BEST, its participants were free with their ideas for system improvements. One early idea was the use of a single BESTALL address code for messages sent to all state teams. This eliminated the need to type 40-60 address codes. Other ideas that evolved into new features or services included the development of disks for stored information that did not require,or was too costly,for on-line access. The ERIC Computer Literacy and Microcomputer Selection and Evaluation database discs were two resulting products.[6]

[redacted]

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[6] Two microcomputer data diskettes and one program diskette for use on the Apple IIe personal computer were jointly developed by Project BEST and the ERIC Information Resources Clearinghouse at Syracuse University. The data diskettes contained a selected search of the ERIC, RIE and CIJE database on two topics: Computer Literacy and Hardware/Software Selection Issues. The diskettes were made available to each Project BEST State Team Leader for use within their state and with permission to reproduce. Copies of the BEST/ERIC diskettes are available from ERIC/Syracuse University, Syracuse, NY 13210

- Monitor use.

Various indicators can be used to identify potential problems. Project BEST screened the monthly budget and billing statements for computer time use and connect charges to identify and track the frequency and volume of use. Thus, during early months, we would call states where little or no use was indicated to see if they were having any problems. Frequently, there was a hardware problem that we could help them resolve.

- Provide on-going trouble shooter capability.

Most adults who lack experience with computer keyboards will feel some anxiety when they start to use EMS. Regardless of how complete printed instructions are, all situations cannot be anticipated. It is particularly valuable if a user can call for help while he or she is having the problem and get guidance that can be immediately applied. Project BEST provided this trouble-shooting by phone and by EMS.

Guidelines for USERS

- Be aware of the influence of terminal placement on use.

Most of us like to have tools accessible when we want them. A terminal in one's own office obviously has a greater potential for use than one that requires going to another part of the agency. If one then has to "ask permission" to use the terminal, utilization potential is decreased even further.

- Make paper copies of information.

The contents of the electronic mailbox can be checked on a video display screen alone--a quick and convenient way to determine what is there. In most cases, however, when a terminal and system serves more than one person in an office, it is better to print out all information. This facilitates distribution to those who do not have access to the system and can save money in the event that you want to refer back to an item at a later time.

- Establish a regular schedule for checking your mailbox.

Determine who in the agency may be interested in information on various bulletin boards and how frequently they may want it. Set a regular schedule for checking these boards.

- Post bulletin board information.

Many times lists of meetings, etc. can be posted or routed so other agency staff can have easy access to it.

- Consider whether one person should be given responsibility for using the system.

There are pros and cons to consider. I[illegible] use is limited now because people are not comfortable with the hardware, additional hands-on training can be provided. Also consider having one staff member responsible for inputting messages, checking the machine daily, and routing information to appropriate locations, especially if there is a limited number of terminals.

- Provide a local troubleshooter.

Whether one person or an entire agency has access to the EMS terminal there should be someone in the agency to whom people can turn to for help. In larger SEAs this may be a separate training support facility; in smaller agencies a computer buff may take on this role.

Guidelines for DEVELOPERS

One general conclusion provides the foundation for our more specific thoughts and recommendations:

- Electronic mail (EMS) is a new medium whose most valuable contribution to education is the potential it offers for information exchange and communication among geographically separated professionals. The accomplishment of this outcome is not a function of the information technology alone, however. Active facilitation, brokering and support is required.

When Project BEST began, several participants equated electronic mail to use of data bases like ERIC. While this can be one feature of an EMS, we have found that in several ways electronic mail is a new medium.

Electronic mail systems offer access to information (in bulletin boards and data banks), and people (through message exchange and conferencing).

Both components require development and maintenance. The easier of the two to deal with is the information. Standard procedures exist for entering data for computer storage and there are relatively few user problems inherent in accessing information stored in a computer.

Most problems come in the second instance, when the information source is people, not computers; the majority of these problems arise when the parties do not know one another.[7]

We have long recognized the value of the information people carry with them in their experience. Experience, in fact, has been a prerequisite for leadership. Most of our professional experience exchange takes place in two basic types of networks. There are either task-related networks involving individuals with a common task, outcome or product to develop; or personal need-related networks involving individuals who may have common information needs because they perform similar roles in their organizations. In the first category, the communication is driven by the task and maintains itself until the common end is achieved. In the second category, however, communication and information exchange is driven by personal needs to be informed and by good intentions. We go to meetings, read journals, "shmooz" with peers at receptions to build our own personal stores of practical knowledge. Face-to-face contact is the usual prerequisite to this "give-and-take" process that allows us to share our experiences with others. Once we go back to our home environments, this sharing of possibly relevant experience is maintained only until our good intentions are overwhelmed by job responsibilities.

EMS offers it greatest potential for this latter network where there is a need for two-way information flow without a mutual task to motivate it. For example, personnel in State Education Agencies face that situation. Most of a State Education Agency's functional communication is intra-state with schools or other agencies. There are few tasks that require them to communicate with other SEAs on a regular basis.

Other groups with similar communication needs include professional and trade associations and national programs in the public or private sectors such as Headstart or United Way. (In both of the latter cases professionals perform similar functions in locally-controlled units.)

To take advantage of its potentials, the EMS developer and operator must consider additional operating strategies that go beyond the identification, storage and processing of information.

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[7] This latter situation is the one in which Project BEST found itself during most of the implementation of BEST NET. State teams were composed, in most instances, of SEA basic skills and technology specialists. Except for the team leaders who attended an initial workshop offered by Project BEST staff, most team members were unknown to other teams.

- Provide reasons to communicate by electronic mail.

Electronic mail systems like BEST NET offer opportunities to communicate but (after the novelty wears off) not a reason to communicate. In order to provide functional experience with electronic mail, tasks can be created that require exchange of information with others in the network. Small work groups, for example, could be established during a face-to-face workshop, with tasks to be completed after participants return to their respective offices. The interaction would then continue via electronic mail. Or, one could establish on-going committees to develop specific state-related materials for the teleconferences. The committee would communicate by electronic mail and phone to conduct its work.

- Provide support to facilitate communication via electronic mail.

Need-related information exchange among peers, who in some cases may not know each other, can be maintained if a facilitator, broker, or linking agent is available to act as a switchpoint to refer and match needs and experience.

Staff members can be assigned to serve as liaison to a constant set of states or other units. They would stay current on what's happening in those states through phone, mail, or EMS contact. They could also serve as a broker or linking agent when a state had a request. Instead of putting out a general "who-knows-about" request, a state would contact their liaison, ask for specific referrals[8] and initiate a more targeted request. As the user experiences at the beginning of this section indicate, there is little satisfaction in general requests--for either the initiator or recipient. Using electronic mail for these types of requests or searches is valid, (especially when you do not know the others on the network). If, however, these become the main type of message traffic, it may have negative consequences. Like form letters in the mail, they do not have as much power to evoke a response as do personal messages or letters. The urge to check your mailbox is lessened when you know that most of what you receive is "junk mail" and form-letter solicitations.

An over-abundance of general request traffic, therefore, during the initial development of an EMS network leads to less frequent checking of the electronic mailbox, which results in longer response times to general requests and thus less frequent requests.

- Maintain the Communication Support

We can look at the above rules-of-thumb and note that we were aware of all of them, had included them in the original Project BEST proposal, and were attempting to implement them. There were to be jointly-developed products that would have necessitated states communicating with each other and with us via electronic mail; project staff were to serve as liaisons to a set of states; and were to stay in touch with state team progress and problems via a monthly State Team Experience Report; and a resource directory was to be provided to each state that would identify everyone else on the network. Nevertheless, once the project got underway, new conditions and resource needs became apparent. First priorities went to the tasks that were time and resource specific--the teleconferences and videotapes. The operation of BEST NET, on the other hand, once it was up and running, did not impose the same kind of pressure on the total project staff. We provided the structured information content (e.g., bulletin boards) but the rest of the content was from the states. As a consequence many of the communication support activities were only partially implemented before the project ended.

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[8] A second form of support can be a resource directory of people in the system. Members of each state team and their responsibilities can be identified. Then individuals seeking information would know who to contact.

The Project BEST situation may have been atypical in its complexity. We were trying to develop and facilitate a process while concurrently developing products. This may not be a condition other EMS developers or operators have to address. There are national programs and associations, however, who may be seeking to enhance their services and products through use of electronic mail networks. For these programs there is a lesson in the Project BEST experience. Priority, and effort, must be maintained for the environment that supports communication. While you cannot control the amount or nature of information exchange in this type of a system, there can be a measure of satisfaction in knowing that, by providing opportunities, reasons and support, you made communications possible.

As developers, it is very clear to us that the implementation of an electronic mail system among peers who share certain common needs but have few common tasks to perform, or products to develop, requires active networking. This networking support is labor-intensive to generate and facilitate the movement of information though the system. For this reason, it represents a major cost and time requirement that must be accommodated in the operating budget of the user network or the EMS operator.

In retrospect, nothing in our experience with BEST NET has changed our original belief about electronic mail. While it has great value as a way to access information and databases, its greatest potential lies in the access it provides for people to contact other people in a direct, simple, and time-saving manner.

People to People ... is still the BEST approach!

APPENDICES

A. CONFER - Conferences Bulletin Board

B. BIBLIO - Bibliographical Bulletin Board

C. JUN30 - Teleconference Bulletin Board

D. NEWS - General Information Bulletin Board

E. PROBMO - Problem of the Month Bulletin Board

F. SOFTIE - Software Information Exchange Diskette

CONTENT OUTLINE

PROJECT BEST VIDEO MODULE NO. 2

"LEARNING AND TEACHING ABOUT COMPUTERS"

MAY 18, 1983

I. "Computer Literacy: What Is It?" - In Pursuit of a Definition

A. Different things to different people

1. More than a term--a concept with several ingredients
2. Knowing what a computer can and cannot do
3. Being aware of a computer's impact, uses, potential
4. An ease, familiarity, and comfort with the equipment
5. The ability to accomplish what you want

B. A basic skill...similar to reading, writing, and arithmetic

C. Consists of four levels/stages:

1. Awareness
2. Comfort
3. Use (as a tool for specific purposes)
4. Proficiency

D. More than just programming/ programming may or may not be necessary

II. A. How do teachers learn about microcomputers? How are schools teaching them?

1. Hands-on experience is a must
2. Clear, effective users' guides and instructional manuals
3. Talking to peers about problems and learnings
4. Formal courses at colleges, universities, or district inservice
5. Taking district computers home on holidays and weekends
6. Networks of resource people to call on after initial workshop

B. What about administrators?

1. Literacy for administrators is different from literacy for teachers
2. Learn best from and among peers
3. Programming is not necessary for everyone
4. Must be positive about microcomputers for a computer literacy program to be successful

C. What about students?

1. Generally self-motivated; no fear of machines
2. Experience in computers is gleaned at home
3. Programming aids logic and problem-solving skills
4. Programmable devices help them to understand computers
5. Not all kids need to learn programming
6. Curriculum often teaches "about" rather than "with" computers because of hardware shortages

7. Computer literacy curriculum can either be taught as a separate course or integrated into the existing subject areas
8. Computer literacy at the high school level needs to complement or expand on what's happening to students at the elementary and intermediate levels

D. What about parents?

1. Parents are eager to learn about microcomputers
2. Teaching parents and students together is effective
3. Parent volunteers are valuable assets to a computer literacy program

III. Advice to Others

A. Involve teachers from the beginning

B. Microcomputers won't solve all problems

C. Plan carefully and for effective use

D. Maintain grass roots movement

E. Use teachers as expert resources

F. Basic literacy should not be sacrificed in favor of computer literacy

USERS GUIDE

PROJECT BEST VIDEO MODULE NO. 2

LEARNING AND TEACHING ABOUT COMPUTERS

MAY 18, 1983

The video module that this guide is designed to accompany presents the computer literacy experiences of personnel from six school districts. These districts were chosen because they are reflective of the size, geography, personal experience, and economic diversity of school districts across the United States that have gone into the use of microcomputers over the past two years. They include: Albany, Ohio; Ann Arbor, Michigan; Cincinnati, Ohio; Cupertino, California; Fairfax County, Virginia; and Plains, Montana.

The video module was designed to be used in conjunction with training activities for the four audiences identified in this guide. Together, these groups represent all persons involved in the development of computer literacy programs in school districts.

The objectives of this module are to:

- Depict the stages and ways in which adults and children in the schools are becoming comfortable with and adapting to new technologies
- Familiarize the audience with the current array of practitioner issues, concerns, and controversy relating to the implementation of computer literacy programs in schools
- Help viewers understand the reasons why schools are currently organizing for computer literacy and how and why they are operationally defining the term.

GENERAL DISCUSSION

- What does computer literacy mean to you? View the module to see what it means to others.
- How are schools in your district teaching computer literacy? As you watch the module, notice how other school districts are addressing this topic.
- What are the major problems/concerns now facing you as you attempt to address the area of computer literacy? The module presents ways that others have addressed it. Look for these as you view the module.

ADMINISTRATORS

Pre-viewing

- What are some of the constraints/variables related to the development of computer literacy programs in your school(s)? As you view the module, notice how others are overcoming their constraints and are controlling their variables.
- How is your school system defining the concept of computer literacy? In viewing the module, determine the extent to which your understanding of the concept is similar/different from those presented.
- List the major computer literacy issues and questions (in terms of management, instruction, and staff development) that your school(s) is now facing. Identify possible solutions as you view the module.

Post-viewing

- To what extent were your issues and questions addressed in this module? What other issues do you need to address and how might you address them?
- What refinements might you now consider making to your current understanding of the computer literacy concept?
- What types of administrative support might you provide your staff as they develop computer literacy programs?
- What level of computer literacy do your staff members have and how can their familiarity with the technology be increased?

CONTENT/CURRICULUM SPECIALISTS

Pre-viewing

- From the perspective of your curricular or content responsibilities, how would you define the computer literacy concept? View the module and determine how others have defined it.
- What staff development issues have you identified in implementing a computer literacy program? View the module and note the staff development issues addressed by others.

Post-viewing

- What refinements or modifications, if any, would you now consider making to your ideas of the computer literacy concept?

- What strategies might you use to help teachers view microcomputers as an instructional enhancement rather than an add-on?

TEACHERS

Pre-viewing

- How would you describe the manner and ways in which you are learning about microcomputers? As you view the module, compare your experiences with those shown.

- How are your students learning about computers? View the module and notice how other students are learning. Look for ways you might use these methods with your students.

- In the module, others are attempting to describe the computer literacy concept. What ideas do you have about the concept? How might you define it?

Post-viewing

- How might the use of computers become an enhancement to what you are now doing in your classroom?

- What are some activities you might wish to initiate for yourself and your students to enhance computer literacy levels?

- What are some ways in which you might involve parents in your computer literacy program?

PARENTS/COMMUNITY GROUPS

Pre-viewing

- How are the students in your school learning about computers? View the module to see how other students are learning about computers.

- View the module and discover areas where your support might be helpful to your school's efforts to develop a computer literacy program.

- What does the term "computer literacy" mean to you? View the module to find out what it means to others.

Post-viewing

- What are some activities in which you would like to engage in order to improve your computer literacy level?
- What are some ways in which you might support your school's computer literacy program?
- What does "computer literacy" mean to you now that you have seen the module?

Guide Sheet

Informational Products Announced on
May 18, 1983
Project BEST VIDEO NEWSLETTER

*1. Diskettes (2) from ERIC Clearinghouse Selected Information Resources from RIE and CIJE on Computer Literacy	Produced (for BEST State Teams) by: Dr. Donald Ely, Director ERIC Clearinghouse on Information Resources Syracuse University School of Education Syracuse, NY 13210
2. BEST NET Bulletin Board (Beginning June, 1983) Software Information Exchange	Available to BEST NET electronic mail users on an experimental basis. Source: Mrs. Bobby Goodson Computer Using Educators Box 18547 San Jose, CA 95158
3. Videotape of teleconference from New York "Computing Strategies for Success"	Carmen Paigo Center for Learning Technologies Media Network Cultural Education Center C-7 Albany, NY 12230 ($40)
**4. Books from State of Tennessee Department of Education Computer Skills Next: A Plan for Grades 7 & 8 Microcomputers in the Schools: An Educator's Guide	Dr. George Malo, Director Division of Research and Development Tennessee Department of Education 135 Cordell Hull Building Nashville, TN 37219
5. Handbook from Santa Clara County Office of Education Computer Education Handbook	Bonnie Pardue Microcomputer Center - Mail Code 237 Educational Development Center Santa Clara County Office of Education 100 Skyport Drive San Jose, CA 95115 ($25 + $5 Shipping and Handling)

6. Guide from Educational Software Evaluation Consortium 1983 Educational Software Preview Guide	Available to State Team Leaders--limit of one copy each upon request. Cheryl Petty Garnette Project BEST/AECT - Room 214 1126 Sixteenth Street, NW Washington, DC 20036 Other persons should contact: Kathy Parks TECC Clearinghouse - Software Library San Mateo County Office of Education 333 Main Street Redwood City, CA 94063
7. Book from the American Association for Higher Education Meeting Learners' Needs Through Telecommunications: A Directory and Guide to Programs	Marilyn Kressel, Director Center for Learning and Telecommunications American Association for Higher Education One Dupont Circle NW - Suite 600 Washington, DC 20036 ($40 to non-members)
8. Book from Office of Technology Assessment, U.S. Congress Informational Technology and Its Impact on American Education (Linda Roberts Case Studies)	Superintendent of Documents U.S. Government Printing Office Washington, DC 20402 ($8.00 #052-003-00888-2)
*9. Videotapes from Project BEST (Available after June 30, 1983) "Teaching WITH Computers--Now You're Cooking!" "Computerwares: Hard & Soft Decisions"	Producer: Project BEST/AECT - Room 214 1126 Sixteenth Street, NW Washington, DC 20036
*10. Guide from Project BEST (Available after June 30, 1983 to BEST State Teams) Users' Guide to Project BEST Products (Print and Non-Print)	Author: Project BEST/AECT - Room 214 1126 Sixteenth Street, NW Washington, DC 20036

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*Complementary copies have been, or shortly will be made available to each State Team Leader. Other interested persons should contact their own, or neighboring State Team Leaders. List of Leaders available from: Project BEST/AECT - Room 214
1126 Sixteenth Street, NW
Washington, DC 20036

**Complementary copies have been made available to each State Team Leader. Other interested persons should contact Dr. George Malo in Tennessee.

COMPUTER LITERACY PROFILE

ALBANY, OHIO

- Rural Appalachain district 8 miles from Athens, Ohio
- Chief employer is Ohio University
- Small, far-reaching school district with a K-12 enrollment of 1,680
- Started in 1980 with an Apple II+, currently have 17 microcomputers of various brands
- Teaching staff of 102

At the Alexander Local School District in Albany, Ohio, computer literacy has brought parents, teachers, and students closer together. The new superintendent, Dr. Raymond Yeagley, brought with him a working knowledge of computers and convinced residents of Albany that there was a place for computers in their small rural school district.

Dr. Yeagley trained the Executive Secretary and the Assistant Superintendent and set the process in motion. Teachers took classes at nearby Ohio University and soon began to train other teachers. The district responded to a heavy demand for training by the community by holding evening and weekend classes for as long as interest held up.

Teams of parents and children learn together about working microcomputers and this has added an extra dimension to the parent/child/teacher relationship in the district. Parents also volunteer their time during the school day to monitor students as they go through exercises designed to familiarize them with the computer and to sharpen their logic and reasoning skills. The school district is currently giving each student roughly ½ hour on the computers every week. This not only gives them experience on the machines, it also reduces overcrowding in the classrooms and gives parents an opportunity to work with the students.

Programming is taught at the high school level. Several different brands of micros are used so that students learn to be flexible in transferring their computer skills. There is still a heavy demand for training from the community, and currently the district is looking for ways to purchase more hardware in order to meet that demand.

COMPUTER LITERACY PROFILE

ANN ARBOR, MICHIGAN

- Suburban area near Detroit
- Chief employers are University of Michigan, Ann Arbor Public Schools, Parke-Davis Pharmaceuticals, Bechtel, small research firms and printing businesses
- K-12 enrollment of 14,500 students; 26 elementary, 5 intermediate, 2 traditional and 2 alternative high schools
- History of mainframe experience; started 7 years ago with mainframe terminals in the high school math department. Began pilot program using microcomputers 2 years ago; now using micros at the elementary level for computer literacy
- Over 300 microcomputers--mostly PETs, some Apples, some TRS-80s
- Teaching staff of roughly 700

In the Ann Arbor Public Schools, computer literacy begins with media specialists. The media specialist in each building is given responsibility for all school A-V equipment, including the microcomputers, often kept in the library or media center. At the onset of the computer literacy program in Ann Arbor, all the school media specialists in the district received microcomputer training. From there, a training model was established to encourage teachers and other faculty to attend classes offered by the district. Anyone interested--teachers, administrators, custodians, secretaries--may attend these classes. A school building receives a microcomputer from the central office for every three people who attend a training session.

Activities on the micros are integrated into all aspects of the curriculum and are often completed during visits to the library or media center. Teachers are encouraged to take computers home with them over holidays and summer vacations to become familiar with them. This is also a protective security measure for the school district. Elementary children are informally introduced to programming and how a computer works by using "Big Trak," a programmable toy tank. The main thrust at this level, however, is on computer awareness.

COMPUTER LITERACY PROFILE

CINCINNATI, OHIO

- Urban school district in southwestern Ohio
- Major employers include large corporations such as Proctor and Gamble, AT&T, and federated department stores
- District enrolls students K-12; total student population of about 51,000
- Total teaching staff of 2,678
- Began using a time-shared mainframe in the late 1960s to improve basic skills instruction and later moved into administrative applications; district is moving to micros for instructional applications
- All secondary schools and more than 50% of the elementary schools have at least one micro; a mix of brands is used including Atari, Apple, TRS-80, Texas Instruments, and Commodore PET

Cincinnati's emphasis in the use of computers has focused on computer managed instruction. Acquiring computer literacy, both for teachers and students, was not a priority in the past, but the situation is beginning to change.

Teachers have learned about computers through courses they have taken independently, school-organized teacher training programs, and courses sponsored by the district. Parents and community volunteers have helped schools that wanted to conduct their own teacher training programs. The district sponsors a Professional Growth Institute that offers credit and non-credit courses on a wide variety of subjects. In the fall of 1982, it was operating five computer-related courses ranging from a basic introduction to microcomputers to computer programming.

In the past, individual schools in Cincinnati developed and conducted their own computer literacy programs for students. District personnel now recognize the need for a district-wide computer literacy program. They are pilot testing available computer literacy programs in the hope that portions of existing courses can be combined, avoiding the need to prepare a new curriculum.

COMPUTER LITERACY PROFILE

PLAINS, MONTANA

- Small rural mountain community; population 1100; located 80 miles from Missoula, Montana
- Logging is primary industry; currently experiencing close to 30% unemployment
- Teaching staff of 36
- Small school district with a K-12 enrollment of 564; elementary and high schools share the same building
- Started 2 years ago with Radio Shack Model III microcomputers; currently own 13 machines

Computer literacy in Plains, Montana is a community effort. Two years ago the superintendent, Jim Foster, surveyed the residents of this small logging community and determined that computer literacy was a priority. After the school district bought 13 Radio Shack Model III microcomputers with Title IV funds in spring of 1981, high school teachers took the machines home over the summer to learn how to use them. The following fall, Radio Shack representatives from Spokane, Washington held a two-day intensive workshop for teachers who would be using the machines at Plains High School. Shortly thereafter, trained teachers spent afternoons, evenings and weekends introducing parents and still other interested teachers and administrators to the new microcomputers.

Computer literacy is defined as an awareness, familiarity, and comfort in working the microcomputer. Although one of the machines belongs to the library in the elementary school, the thrust of this computer literacy program is at the high school level. The program is concentrated in the math, science, and business departments. Students are introduced to computers through a programmable calculator and 9th graders are required to take algebra as well as typing before any computer science courses.

COMPUTER LITERACY PROFILE

CUPERTINO, CALIFORNIA

- Unified school district; serves six municipalities in California's Silicon Valley
- High-tech middle-income community with many aerospace and computer-related industries
- Approximately 13,000 students in a K-8 program
- Began introducing microcomputers for instruction in 1977
- A combination of Atari and Apple microcomputers are used; the district has approximately 170 micros in its 24 schools
- Total teaching staff of approximately 500

Cupertino Union School District has developed a computer literacy program for grades K-8 that focuses on computer awareness, computer interaction skills, and programming. A copy of their revised K-8 computer literacy curriculum was featured in the March 1983 issue of The Computing Teacher (Vol. 10, No. 7, pp. 7-10).

For grades K-6 computer literacy is infused in the regular math, language arts, social studies, and science curriculum. Children are taught LOGO and PILOT. At the junior high school level, introductory programming and applications are taught in a one-semester course that all students are encouraged to take.

Teachers are learning how to use computers in a variety of district-sponsored training activities. More than 20 mini-courses on computer basics, classroom applications, and programming are available through the inservice training program. Participation is voluntary, but teachers receive credit toward time off or the purchase of materials as an inducement to attend. Schoolwide training programs are developed for interested schools. These programs are adapted to the unique needs and conditions of the school. A laboratory training program was offered during the summer as part of a computer camp. In addition, teachers are encouraged to borrow equipment and practice at home. A support system known as the Lead Teacher Network has been set up to exchange experiential information among schools. One teacher from each school attends, shares information, and brings new ideas back to his or her school.

The district offers separate training programs for school administrators and parents. The computer literacy training program for principals focuses on management applications and administrative concerns. Training for parents is designed to prepare them for volunteer work in the school computer literacy program.

COMPUTER LITERACY PROFILE

FAIRFAX COUNTY, VIRGINIA

- Suburban county in the Washington D.C. metropolitan area
- Government and high-tech industries are chief employers; median family income $41,600 in 1981
- Tenth largest school district in the U.S.; enrolls 122,600 students, K-12
- Began using time-shared mainframe in late 1960s for data processing and computer science; now using micros for these subjects and computer literacy in K-12
- Estimated 584 micros, primarily Atari and NEC, in the 159 schools in Fairfax County
- Teaching staff of approximately 7,000

Fairfax County has developed a computer literacy program for teachers and students. The materials for both the teacher and student programs were developed by school district personnel.

Teachers are trained by fellow teachers who can explain how to integrate computer literacy into the on-going curriculum. Teacher training emphasizes how computers can be used in the classroom, rather than computer programming. The program stresses comfort with the keyboard, loading programs, and implications of computing for children, adults, and society. Attendance is voluntary at these after-school classes. Teachers' interest is high, as indicated by the operation of over 20 classes per semester during the 1982-83 school year.

The student computer literacy program focuses on: (1) how the computer works, (2) the impact of computers on the home, (3) the impact of computers on careers, and (4) hands-on experience. A formal computer literacy curriculum is being developed by the school district staff. The curriculum at each grade level is designed to coordinate with the regular course of study. It was written by district teachers based on their classroom experiences, field tested, revised, and then distributed during the 1982-83 school year. The computer literacy curriculum assumes that children will be learning about computers throughout their school careers. Consequently, the elementary school curriculum is quite basic; lessons become more complex at the intermediate level, and computer applications are taught at the high school level.

PARTICIPANT FEEDBACK FORM

PROJECT BEST MAY 18, 1983
VIDEO TELECONFERENCE

Your comments have been helpful to Project BEST in enhancing our understanding of your information needs and in designing future materials to respond to those needs. We would appreciate it if you would take a few moments to comment on the teleconference and support activities. Please note that the feedback form lists the objectives of each element of the program. We ask that you evaluate the elements in terms of what we attempted to accomplish.

A. The Videotape: Learning and Teaching ABOUT Computers

The primary audience for the videotape is LEA staff. SEA personnel involved in state computer literacy programs are a secondary audience. After viewing the videotape, participants should:

- Know that there are many different definitions of computer literacy;
- Know how several different districts are helping adults and students become comfortable with the technology;
- Feel prepared to define computer literacy for themselves; and
- Be interested in acquiring computer literacy skills.

1. Please evaluate the videotape in relation to the objectives and target audience listed above. Rate the tape on the following characteristics using a scale of 1 to 7 with "1" to represent low and "7" to represent high.

		Low 1	2	3	4	5	6	High 7
a.	Informative content	___	___	___	___	___	___	___
b.	Useful method of presentation	___	___	___	___	___	___	___
c.	Utility to LEAs and schools	___	___	___	___	___	___	___

2. What were the strengths of the videotape?

3. What suggestions would you offer for the design of the remaining videotaped segments about schools?

B. The Teleconference: Becoming Literate with the New Technology

The audience for the teleconference is the State Project BEST team and any other guests invited to attend. It is possible that LEA personnel may be interested in seeing a videotape of the teleconference, thus they constitute a secondary audience for the teleconference. The purposes of the teleconference are to explore:

- issues and concerns relating to the implementation of computer literacy programs in the schools;
- the potential role of the SEA in fostering computer literacy; and
- how the videotaped segment can be used in computer literacy training programs in the states.

1. Please rate the teleconference panel and question and answer session on the following characteristics. Consider the objectives and audience noted above and use the following rating scale: 1 to 7 with "1" representing low and "7" representing high.

	Low 1	2	3	4	5	6	High 7
a. Informative content	___	___	___	___	___	___	___
b. Useful method of presentation	___	___	___	___	___	___	___
c. Relevance to your work	___	___	___	___	___	___	___
d. Utility to LEAs and schools	___	___	___	___	___	___	___

2. What were the strengths of the teleconference?

3. How would you improve the format if panels and Q and A call-ins are used in future Project BEST video conferences?

C. Video Newsletter

The video newsletter is intended for SEA personnel. Its purpose is to update Project BEST state teams and other SEA personnel about

- current developments in the field, and
- news about Project BEST.

Please consider these objectives in rating the effectiveness of the newsletter.

1. Please rate the newsletter on the following characteristics again using a 1 to 7 scale with "1" representing low and "7" representing high.

	Low 1	2	3	4	5	6	High 7
a. Informative content	___	___	___	___	___	___	___
b. Useful method of presentation	___	___	___	___	___	___	___
c. Relevance to your work	___	___	___	___	___	___	___

2. What were the strengths of the video newsletter?

3. How would you improve the design of the video newsletter?

D. Print Support Materials

The materials are intended for viewers of the videotape, the newsletter, and the teleconference. Their objective is to provide background information that will assist viewers in understanding the video material.

1. Please rate the print materials on the following characteristics again using a 1 to 7 scale with "1" representing low and "7" representing high.

	Low 1	2	3	4	5	6	High 7
a. Clearly written	___	___	___	___	___	___	___
b. Well organized	___	___	___	___	___	___	___
c. Useful content	___	___	___	___	___	___	___

2. When were you given the print material?

   a. In advance of the teleconference ______

   b. At the teleconference ______

   c. After the teleconference ______

   d. Not given a copy ______

3. Did these materials help you understand the content and focus of the program?

   a. Yes ______

   b. No ______

E-ITV

Editorial

On Teleconferencing

WE'RE VERY PLEASED to include in this, our annual update issue on teleconferencing, the first of the two-part report on Project BEST by Lewis Rhodes, associate director of the project. BEST is the U.S. Department of Education-funded study intended to find ways of helping state education agencies apply new technologies. One of the new technologies studied was video teleconferencing, and Mr. Rhodes reports that its use can result in significant improvements in the educational administrative process. He observes that, if educators use teleconferencing as they should, and as he has seen it used by industry, the result could be " . . participative problem-solving as a regular part of running the school."

We recommend Mr. Rhodes' report (starting on page 24) to you, whether you are in education, business, health care, or some other endeavor. The guidelines for effective communications by teleconferencing are valid for everyone.

Facts About Project BEST

- *Purpose:* Project BEST (Basic Education Skills through Technology) was intended to provide information and technical assistance to state education agencies (SEAs) in applying new information technology to their particular state efforts to improve basic skills instruction.

- *Funding:* Support for the project came from the Division of Educational Technology, Office of Libraries and Learning Technologies of the U. S. Department of Education, through a contract to the Association for Educational Communications and Technology (AECT), Applied Management Sciences (AMS), and Maryland Instructional Television (MITV).

- *Participants:* Forty-one states and territories took part in this two-year, national, capacity-building and technical assistance project. Teams of staff members who were interested in applying advanced technologies to their own work were formed at each state education agency.

- *Technologies:* The project utilized the following technologies in its own operation:

  - ★ *Satellite video teleconferences* via PBS' CONFERSAT system; state teams usually met at the PBS station nearest the capital city.

  - ★ *Audio teleconferences* via a number of national and regional bridging services.

  - ★ *Electronic mail* via BESTNET, a project-designed and -maintained information exchange and bulletin board service.

  - ★ *Videotape modules* designed to capture a sense of the "technology revolution" at the grass-roots level. These tapes were transmitted via CONFERSAT before or during the teleconferences, and were taped at each site.

- *Key personnel:*

  - ★ Dr. Henry Ingle, Project Director (AECT)
  - ★ Lewis Rhodes, Associate Director (AMS)
  - ★ Frank Batavick, Executive Producer (MITV)
  - ★ Charles Bokor, Producer (MITV)
  - ★ Ann Erdman, Project Officer, U. S. Department of Education

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LEARNINGS ON VIDEOCONFERENCING FROM PROJECT BEST

by Lewis A. Rhodes

AS YOU ENTER the Project BEST (Basic Education Skills through Technology) offices at the AECT (Association for Educational Communications and Technology) in Washington, D.C., two small signs catch your eye:

> Microcomputers may be the best thing to happen to telecommunications. They've given us a *reason* to communicate.
>
> *Remember*: We are experts in connecting people to solve problems and learn from each other. We are *not* microcomputer experts.

These two daily reminders to the project staff help explain why this national technology project appeared to focus on microcomputers but was actually teaching about telecommunications.

Project BEST was developed to respond to a unique scarcity in education today: the absence of a knowledge or research base to support users of the new information technologies (microcomputers and interactive telecommunications). Continuing changes in hardware, software, and resulting applications generate an ever-expanding base of new information, but most of this information is at the level of *current experience*, not research. What educators need, as perceived by the developers of Project BEST, is to have ways to tap and stay in touch with this changing base of personal experience.

To signify this purpose, the Project chose *People-to-People — The BEST Approach* as its logo. Telecommunications provided the people-to-people linkages — both *interactive* (audio and video teleconferences, electronic mail) and *fixed* (videotape) media. The content of most of the information that moved through these links, however, dealt with microcomputers, since project participants (teams of educators at state education agencies) viewed this technology as their most immediate concern.

To assure that Project BEST participants (including the project staff) had the opportunity to explore the potentials, effects, and consequences of both telecommunications and microcomputers, the Project made a major effort to allow all concerned to reflect on the Project's own use of technology and to learn from that experience. The observations, generalizations, and guidelines included here are a result of that systematic process. They are not intended to be prescriptive, but are offered as a beginning attempt to refine "current experience" into generalizable knowledge.

Intentions and Variations

Project BEST initially proposed four videoconferences that would serve as *work sessions* involving project staff and state team members. The focus for the live communication exchange would be the videotapes and other awareness/training materials that the Project was developing for SEA (state education agency) use with local schools. As noted at the time:

> The satellite video teleconference will serve as a meeting between the developers and users of the video materials. During the teleconference, contextual information will be presented about issues or principles involved in the taped examples through discussion with experts and, in some cases, the educators involved in the practice. Underlying issues related to the *use* of the materials will also be discussed.

None of the Project's five teleconferences (a fifth was added as a vehicle for Secretary of Education T. H. Bell to annouce his Technology Initiative) achieved that intended level of interactivity. However, a wide range of formats was explored in response to differing, and sometimes unanticipated, conditions. One teleconference (Secretary Bell's) was totally prestructured with nothing left to chance. Another, in January, 1983, originated from a remote site, the AECT convention in New Orleans. Two conferences, in October, 1982, and June, 1983, used dual origination sites.

In addition to the origination variations, the Project explored three different modes of participant interaction:

1. *Between field participants and studio participants.* Viewers at the various sites could call the studio to comment or ask a question on the air.

2. *Among field participants.* The teleconference in October, 1982, was presented in two sections with an hour's break. During the "black" time (which was used to transmit a Video Newsletter to be recorded at the downlink for later viewing by state participants), each of the 45 state sites participated in smaller audio conferences with nine or ten other states that had similar concerns. When the national teleconference resumed, a project staff member who had facilitated the audio sharing sessions presented a brief summary to the entire conference and a panel responded.

3. *Among field participants at each viewing site.* Each Project BEST teleconference had "suggested pre- and post-viewing activities." Each viewing team, however, had the responsibility of using the teleconference in whatever ways would help achieve its *own* objectives. Depending on the subject matter, some teams invited local educators; others involved personnel in other sections of the state agency or government.

Although the use of these various formats was not entirely anticipated, it did serve to demonstrate what could be done.

Lewis A. Rhodes is a senior technical advisor at Applied Management Sciences in Silver Spring, Maryland, who helped to develop Project BEST (Basic Education Skills through Technology), and served at its associate director.

This article is adapted from one of the Project's "learnings" papers, "Video as a Medium for Sharing Experiences," and is the first of two. The second one, which documents the learnings about the use of videotape, will appear in a subsequent issue this fall. Project BEST was a national effort supported by the U.S. Department of Education.

Problems Encountered

As in any human effort, each modification in the Project's original intentions was the consequence of some barrier we encountered. Many of our problems derived from the relative newness of the satellite videoconferencing medium. As is often the case with new tools, we found that both terminology and expectations were shaped by prior experiences with similar tools. Moreover, one potential benefit of the new medium, i.e., peer interaction, did not fit easily into present organizational environments that had evolved before this outcome could be achieved on a practical basis.

Terminology. Early in the Project we noted: "The term 'teleconference' is beginning to take on generic meanings that make it difficult to know what is being described when it is used." Our personal experience continued to confirm that. It is increasingly popular to attach the "teleconference" label to anything that is broadcast via satellite. Yet most of what is transmitted (on our initial teleconferences, and in those of others we viewed) is a one-way presentation that does not contain (nor sometimes even need) the viewer interaction the term "conference" implies. Use of the label "teleconference" may raise expectations for interactivity in the viewer's mind that can result in dissatisfaction with a presentation which was never intended to be anything more than a presentation.

Old assumptions. Compounding this general lack of clarity about "teleconferencing" is the natural inclination to fall back on old assumptions. Because the information is transmitted and received as "television," it is easy to perceive the activity in terms of the medium as we have known it until now — i.e., as a *presentation* as opposed to a *communication* medium.

For example, in most purposeful television presentations, audience needs and characteristics are anticipated but not specifically known. Audiences, therefore, are perceived in such generalized terms as "elementary teachers," "SEA staff," etc. Because the specific audience needs are not known, we must assume that the presentation may not "hold" some viewers who may neither want nor need the information. Consequently, a significant production effort must be devoted to capturing and holding viewer attention.

Satellite telecasts, however, are not usually aimed at general audiences. Typically, they have a more limited, target audience that is known, can be specifically described (e.g., "Project BEST state team leaders" or "state reading specialists"), and whose needs can be determined more directly. In these cases, we may assume that the audience can be perceived and dealt with as *participants*, not viewers. Attention-grabbing production effects *per se* become less important.

Satellite telecasts *are* television, however, and have several inherent potential advantages. Among them are: 1) the *effectiveness* of organized audio and video presentations, 2) the relatively *low total cost* when one factors in the expense of moving people who have a reason to communicate to one central meeting location, and 3) the lack of *time limitations* usually found on open-circuit broadcast channels.

Notwithstanding their potential, these same features can be applied under the "old assumptions" about television as a presentational medium. The results: 1) *longer* one-way presentations of information, 2) "*shotgun*" presentations (to reach as many as possible with as much information as possible), and 3) *token interaction* where only one person at a site has access to a phone or microphone, and even then, insufficient time is allowed for all sites to participate fully.

In education, as opposed to industry, most of the videoconferences that we observed were employing the medium for formal, predominately one-way, organizational communication. Time [for interactivity] was usually tacked on at the end and participation was too limited.

Support for interaction. That last result — token interaction — relates to the most pervasive barrier we encountered. There is little background or organizational support for interaction among professionals in the course of the *regular operations* of schools. Most educational professionals are dealt with as "independent practitioners." They do not have jobs that legitimately require them to interact with individuals outside their offices or classrooms to solve daily problems. This latter type of interaction is done informally, usually on one's own time, at professional meetings, through phone calls to peers, and indirectly via access to research.

Consequently, there has also been relatively little experience in education with using telecommuncations (until now, television and radio) to support regular interaction as a function of school administration and management. Over the years, the earnest endeavors to discover unique contributions of these media to teaching and learning have focused more on the *content* of education than on its process. Concern has focused on how to use the media to present information to students rather than on how media could help solve the problems that constrain good teaching and learning. Telecommunications technologies, therefore, have had few opportunities to be used for improving the lot of those who deal daily with the problems of "running the shop."

Learnings

What are we taking away from the Project BEST experience to apply in future, similar situations? First, there are some general ideas that may be worthy of additional exploration, and second, some specific guidelines to remind us not to apply "old assumptions" mindlessly. In both cases, we are referring to video*conferences* — telecasts used in an interactive communications context.

General Thoughts

The teleconference (here we include audio and computer conferencing as well) is the medium with the greatest potential for American education today. Why? Because it relates to the *process*, not just the content, of the system. The "process" of any organization is the way it solves its problems. Whether it is called management, administration, or decision-making, information is gathered, alternatives are explored, and resources are allocated in response to ever-changing conditions. Many of education's problems today are in its "process." Dedicated professionals in the school could handle most of the content concerns if the larger support issues were resolved.

But how does interactive teleconferencing relate to the process concerns? In planning Project BEST teleconferences, we reviewed a number of teleconferences from education and business organizations. We discovered some similarities and differences in the ways these two sectors were using teleconferences.

First, organizations in both industry and education use teleconferences when they have a *communications problem or task*. They appear to be used differently by the two sectors, however. To find out why, we looked at the types of tasks or communications problems to which they were being applied. Here we had to confront the *dual* communication systems that exist in most industrial or educational work settings.

First are the *formal* communications channels and mechanisms provided to ensure that decisions are carried out efficiently. Most of the information flow through these channels is one-way. Second, and co-existing with these formal information channels, is an *informal* system of communications. Most of an organization's problems are resolved via the informal channels. Why? These channels, or linkages, are *purpose-* or *task-related*, the participants have more *control* over the stucture of and content of the system, it is more *interactive*, and a greater degree of *trust* is involved because the participants know one another. Yet this latter process is seldom given legitimacy as a "system" and is kept relatively invisible.

(Continued to page 63)

Project BEST

(Continued from page 25)

Nevertheless, when we looked at where teleconferencing and other interactive telecommunications media appeared to be of most value today, we found that it was for these *informal*, organizational, problem-solving communications. (Note the increasing number of television commercials for audio and video teleconferencing—they always show a group of people who know one another in a problem-solving situation.)

Yet there was a major difference. In education, as opposed to industry, most of the videoconferences that we observed were employing the medium for *formal*, predominately one-way, organizational communication, e.g., to announce a decision, present new information, etc. Interactivity, when it was included, was usually of the clarifying- or challenging-question type. Time for it was usually tacked on at the end and participation was too limited.

I noted earlier that education has no extensive history to give legitimacy to participative problem-solving as a regular part of running the school. But today, we have an overwhelming need for peer information exchange so that local decisions can be enhanced by others' experiences. Actually, telecommunications can facilitate two different forms of peer exchange: 1) for people with *common tasks, outcomes, or products* who need regular interaction as they work toward their mutual goal (they can be individuals with differing backgrounds or skills who are interdependent because of the assigned task), and 2) for people with *common needs* (they can be individuals with the same jobs but in different institutions who need periodic exhange to expand their own knowledge bases; no specific task or decision may be involved, and each participant may take away what he or she needs).

One final general thought, lest it look as though the responsibility for effective telecommunications lies solely in the hands of the educators: Teleconferencing requires a new combination of production skills. We must draw upon two different knowledge bases—television production and meeting or training design. Our task is analogous to asking creative painters, who have been painting within fixed, two-dimensional frames, to become *architects*. In their new role, they are to apply the same principles of balance, form, and unity, but in a frameless, four-dimensional space. (The fourth dimension is *time* because the design has to respond to the needs of future occupants.) Since all future needs can't be anticipated, an architect designs what might be thought of as environments or *opportunities* within which people can work or live.

In the same way, we need telecommunications architects—people who combine telecommunications skills with group process skills; who can design *opportunities* for task-focused, interactive communication, and who can live with somewhat less "control" over all the elements of the "production." These are designers working with a broader "pallette" since their criteria for success go beyond the television medium to include the larger task the communication is intended to impact. They must have the ability to apply creative design not just to content, but also to the *linkages* that feed the content.

Guidelines

These rules-of-thumb for producing satellite videoconferences have evolved from the informed trial-and-error process of running a two-year, national telecommunications project. If they appear too directive, this is because we have developed them primarily for our own use.

1. Transmission of a video presentation by satellite may add an air of importance to an activity, but the novelty quickly wears off if the information being presented does not meet the needs of those receiving it. We now have the capability to deliver information to specific individuals and groups to meet specific needs. Be clear about the *purposes* of the satellite telecast and its *relationship to the needs* of the primary audience(s).

2. Do not be afraid to be "too specific." Understanding of any particular information is enhanced when the presenter *structures* it *toward a specific need*. This does not mean that others cannot also receive and understand the information. We do this every day—learn from information intended for others. It is the clarity resulting from producing toward a specific audience that results in more effective presentation of the information from which others can learn.

3. Determine the *organizational relationships* of the participants and how the teleconference relates to their work.

- Are the reception sites organizationally under the "control" of those developing the presentation? Is the purpose to have them all get the same things out of the activity?
- Is there a national agenda that is structuring the meeting? Or is the television presentation supporting local agendas at each reception site?

4. If the receiving sites are, in fact, "participants" and not semi-passive "viewers," you will need a receiving site spokesperson who does more than manage logistics. *Information* will be needed from each site *ahead of time* if the centrally televised portion of the conference is to be useful and relevant to the varying local situations. After all, it will be their objectives for the meeting (not yours alone) that will determine whether your communication is successful.

5. Make sure the human relationships that the telecommunications linkage is reinforcing are provided for, that is:

- Don't expect *open communication* if the participants don't *know or trust each other* to some extent.
- Don't expect a common response unless participants have a *mutual concern or need*.
- Expect to devote some effort to *verifying* and/or *establishing* these *relationships* before the teleconference. It will ensure communication and decrease the need for non-functional, attention-holding television production techniques.

6. Be clear about the nature and extent of interaction that will be possible. Make sure that the teleconference participants share these expectations.

Interaction with the presenters of the material is no more necessary for video presentations by satellite than it is for video presentations by cable, broadcast, or other distribution methods. Interaction or involvement with the ideas being presented can be important, however, for effective communications. Interaction can serve several needs of the participants: 1) to *clarify* information through questions, 2) to *internalize* information through discussion, or 3) to *add* or *exchange* information.

Determining who should be involved in the interaction ought to be one of the first considerations for the satellite video communicator. Options include: 1) discussion among participants at each viewing site, 2) interaction among viewing sites, and 3) interaction between viewing sites and the presenters.

When the interaction takes place should also be considered. Unless there is some developmental purpose for feeding information back into the "live" communication process, it need *not* necessarily be part of the satellite broadcast.

7. Must every video element be part of the real-time telecast? Consider transmitting ahead of time those presentational portions that might be shown at the local site at other times, before or after the satellite broadcast.

One final rule-of-thumb: Don't accept anyone else's rules-of-thumb until you test them against your own experience. The field is too new to lock into answers that apply to all situations. Find opportunities to participate in, as well as to produce, videoconferences. Stay aware of what it *feels* like in both roles. Look at the decisions you make and ask the reasons why. ☐

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WHEN IS A TALKING HEAD NOT A TALKING HEAD? — WHEN YOU'RE INTERESTED IN WHAT IT SAYS!

by Lewis A. Rhodes

SOME TIME along about the late 1960s, many of us in educational or instructional television forgot that we were being paid to convey messages to people's brains, not just to their eyes. Why? The disparate and amorphous nature of the television audience made it difficult to determine the effects of our messages. Evaluation of program success focused on "attention" and "liking;" even the term "viewer" helped mask the fact that our business was *communication*, not just *presentation*.

Soon, anything that did not keep the viewers' eyes riveted to the screen became "bad" TV, and "worst" of all was a shot of a person addressing the viewer directly . . . the notorious "talking head." Had he lived through this period, Confucius surely would have written, "One picture is worth a thousand talking heads."

I include this reminiscence as an introduction to this second discussion of the learnings from Project BEST. The earlier article (see the August, 1983, issue) shared information and learnings about the Project's experiences with videoconferencing; this one recounts what the Project staff learned as it tried to capture and communicate current human experience via videotape — especially what it learned about talking heads. Before dealing with how the Project used taped talking heads, however, let me first provide the necessary background.

Why Videotape?

Project BEST was designed to help state education agencies enhance their capacity to use the new information technologies in their own operations and services to schools. One basic Project strategy was to use the technologies themselves to conduct the work of the Project in ways that would provide functional experiences for state-level participants. ("Functional" means experiences that are related to their current work, not merely participation in a "demonstration.")

Facts About Project BEST

- *Purpose:* Project BEST (Basic Education Skills through Technology) was intended to provide information and technical assistance to state education agencies (SEAs) in applying new information technology to their particular state efforts to improve basic skills instruction.
- *Funding:* Support for the project came from the Division of Educational Technology, Office of Libraries and Learning Technologies of the U. S. Department of Education, through a contract to the Association for Educational Communications and Technology (AECT), Applied Management Sciences (AMS), and Maryland Instructional Television (MITV).
- *Participants:* Forty-one states and territories took part in this two-year, national, capacity-building and technical assistance project. Teams of staff members who were interested in applying advanced technologies to their own work were formed at each state education agency.
- *Technologies:* The project utilized the following technologies in its own operation:
    - ★ *Satellite video teleconferences* via PBS' CONFERSAT system; state teams usually met at the PBS station nearest the capital city.
    - ★ *Audio teleconferences* via a number of national and regional bridging services.
    - ★ *Electronic mail* via BESTNET, a project-designed and -maintained information exchange and bulletin board service.
    - ★ *Videotape modules* designed to capture a sense of the "technology revolution" at the grass-roots level. These tapes were transmitted via CONFERSAT before or during the teleconferences, and were taped at each site.
- *Key personnel:*
    - ★ Dr. Henry Ingle, Project Director (AECT)
    - ★ Lewis Rhodes, Associate Director (AMS)
    - ★ Frank Batavick, Executive Producer (MITV)
    - ★ Charles Bokor, Producer (MITV)
    - ★ Ann Erdman, Project Officer, U. S. Department of Education

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Lewis A. Rhodes is a senior technical advisor at Applied Management Sciences in Silver Spring, Maryland, and helped develop Project BEST (see the accompanying box of information about the Project). This article is the second adapted from the Project's "learnings" papers. The views of the author do not necessarily reflect those of the U. S. Department of Education in either this article or the previous one which appeared in our August issue.

The functional need that drove most of the efforts of Project BEST was the fact that state personnel needed to understand the "microcomputer revolution" so they could help schools deal with it. The technological tools we used were primarily telecommunications media — both interactive (video and audio teleconferencing and electronic mail) and fixed (videotape modules). We chose these particular media because of:

1. the expanding and changing nature of the available information and knowledge about computers in education;
2. the character of the information that schools really use to improve their practices, and
3. the nature of the television medium itself.

The Nature of Information and of the TV Medium

No one wants to make a wrong decision. For assurance, each of us turns first to his or her own experience, then to knowledge derived from the experience of others. As educational leaders respond to society's renewed interest in technology, they find both these resources rather inadequate. Few have themselves had experience with microcomputers, and there is no extensive knowledge base of tested research. Moreover, constant changes in hardware and software and the continuing development of new classroom applications for computers make it practically impossible for anyone to stay current.

Because the microcomputer phenomenon struck so suddenly, there are few "authorities" available — there are only some people with more experience than others. To cope with this situation, computer users are creating new ways to tap into the experiences of their peers. Computer clubs, magazines, and newsletters are thriving because they provide ways to exchange and build on this base of experiential information.

Teachers in schools have special information needs. They operate in "real time." Regardless of the curricula and lesson plans they use, they must simultaneously balance and try to respond to the changing needs of 20 to 30 different students. To help them respond both promptly and appropriately, teachers amass, over time, a bank of ideas and rules upon which they can draw. They continually build this personal resource base by seeking information that:

- is *pragmatic* in focus — they need tools and strategies that deal with the largest number of unexpected contingencies.

- emerges from *classroom practice* under everyday classroom conditions (as opposed to conditions in the "experimental" or "model" classroom). As Michael Huberman pointed out in his article "Recipes for Busy Kitchens: A Situational Analysis of Routine Knowledge Use in Schools" (*Knowledge* for June, 1983), "Teachers learn more from observing peers at work than from examining the products of that work." They know from their own experience that the success of a new practice depends on the relatively invisible context of the classroom — local working relationships, pupil characteristics, and community attitudes.

- is transferred *personally* — the most powerful information is obtained firsthand through one's own experience. After that, as Huberman also points out, practitioners are "particularly open to inputs from other practitioners, and especially open to suggestions or explanations that are anchored in experience. An account by a teacher with children at the same level of how a discipline problem was successfully handled is likely to carry more weight than a half-day, in-service workshop on the same topic."

The staff of Project BEST realized that television is not a medium that is best suited to the communication of "facts." As Neil Postman noted in his article "Engaging Students in the Great Conversation" (*Phi Delta Kappan* for January, 1983), television presents *experience*, not commentaries *about* experience. Consequently, the Project staff realized it made sense to capitalize on this strength the medium has for dealing with the present situation, i.e., use it to document information that exists largely at the level of personal experience, and then use it to help schools learn about experiences of others in situations similar to their own.

The Project thus chose to use interactive telecommunications to provide the links for experience exchange among the state education agency personnel (hence our logo — People-to-People: The BEST Approach). To respond to the needs at the school level, however, the Project turned to videotape.

Video Modules

An early Project BEST planning document stated:

> These videotape case studies will document the key experiences of school practitioners who have been using microcomputers effectively in basic skills education. They will be short, organized in a manner that will allow variations in use, and not become outdated in a short time.
>
> Each video module will be designed for an audience of *adults* who work in or with education. These people know what children look like and are not turned on by pictures of kids being happy with hardware (although a review of most "demonstration" materials might suggest otherwise). What they seek instead (observe their behavior in meetings with peers) is information from others in situations like theirs, for example:
>
> - what the technology allows them to do or accomplish;
> - what's involved and how they handle it;
> - how they feel,
> - what didn't work and what they learned from it, and
> - what constraints they had to deal with and how.

The modules were designed to serve as triggers and confidence-builders. Their purpose was to create interest and awareness sufficiently strong to motivate viewers to seek further information and to make them realize that they were not alone as they confronted the new technologies.

Each tape or module would address a primary concern of local educators that was likely to continue for a number of years, and would illustrate how a number of schools with varying resource bases dealt with this common issue. Thus, the tapes were "how-do" rather than "how-to." They showed how schools were:

- getting started with the new technologies.
- learning and teaching *about* computers.
- making decisions about hardware and software.
- teaching *with* computers.

Six very different school districts served as sites for the taping — Cincinnati, Ohio; Plains, Montana; Cupertino, California; Fairfax County, Virginia; Albany, Ohio, and Ann Arbor, Michigan.

Production Concerns

The production team faced three problems throughout the development process. They had to cope with 1) searching and researching at the same time, 2) documenting experience after the fact, and 3) a pervasive fear of the "talking head."

Searching and Researching

Traditionally, a person has an extensive understanding of a topic before attempting to communicate it to others. The shallow depth of knowledge about what was happening in schools with computers prevented this. We had to search *and* research while in the field. Another complication was that the shooting at all the sites had to be completed before the final scripts for the four modules could be prepared since each module would show how a variety of schools dealt with a common issue.

Information gathering took place incrementally in three steps:

1. We selected 25 school districts from more than 100 nominations. We then conducted phone interviews to gather sufficient data from which to select six sites that would be broadly representative. All sites had to have at least two years of experience with microcomputers.

2. A three-person team made a pre-shoot visit to each site. The visit served to identify what had happened, locate the principal actors, and select suitable areas for later shooting.

3. The team audiotaped interviews and transcribed the tapes into notes upon its return from each initial visit. This written documentation made it easier to identify who needed to be asked what questions during the actual shooting, and to identify patterns and trends across districts for use in the final scripts.

The importance of this documentation was reinforced when we realized we were not always finding what we expected. The introduction of microcomputers was not following the old "rules" of top-down implementation. The grass-roots nature of the changes we observed was good news because it was even more of a made-for-TV "people" story than we expected.

The bad news (we later discovered) was that some viewers would not realize this reversal that had taken place in the change process, so would have different assumptions and expectations. Building-level school personnel, for example, reacted more favorably to the nature of the information in the modules than did college personnel or those without recent classroom experience.

In retrospect, the process of uncovering and trying to understand what was happening so we could turn it into generalized information and communicate it to others was an exciting dimension of the undertaking. It was not as pleasant for the production crew, however. Because of weather conditions and time pressures, some of the shoots had to be conducted before all the pre-visits were completed. The crew, therefore, had to anticipate what information or cover shots might be needed for the final modules.

Documenting experience after the fact

During the shoot, we structured the interview process to re-create what it was like to be that person at that time in that specific situation. We wanted people to talk only about what they knew from their own experience, not about what they believed others should do.

We had two reasons for this. First, it was important to record words with feelings attached. Feeling-words create pictures in the viewer's mind. (This is where Confucius' equation of one picture equals a thousand words makes sense.) Second, because it was "their story," we wanted the interviewees to present information in a narrative format. Recent brain research suggests that information encapsulated in personal experience is easier to recall. The mind continuously tries to understand and make sense of data it receives by tying it together into a logical "story" or narrative.

The interview questions varied somewhat from one person to another, but fit a common structure. First those interviewed established a framework for their individual stories by describing what was currently happening. Then they returned to the point at which it all began and recounted the history of their experiences, progressing through the events leading up to the present.

Once the picture was filled in, the interview usually ended with two questions: 1) What were your biggest problems? 2) What have you learned from all this? Some of the most useful and communicable information came from the answers to these two questions.

Two problems complicated our attempts to re-create experiences and communicate them to others. The first was that some people in schools and universities tended to talk in impersonal terms, espousing rules for others with "shoulds" and "musts," and speaking for their organizations, not themselves. We taped few of these individuals, and those we did record were eventually omitted during editing.

The second and more substantive problem created by our approach was that the stories we were capturing came from "talking heads." Most of the situations described could not be re-enacted. The question we wrestled with was one of how much related visual information we could put on the screen without conflicting with or drawing the viewers' attention away from the pictures being formed in their minds by the story being told? This was a pervasive concern throughout the entire production period that was aggravated by our own lingering fears about the "talking head" approach.

The Talking Head

Our own ITV experience gave many of us an aversion to what we perceived as "talking heads," perhaps because, in the past, these heads were talking *about*, rather than *re-creating*, an experience. In many cases, television teachers play the role they play in the classroom and present information about others' experiences. Because TV is a poor medium for talking *about* experience, pictures and production effects have to be added to capture and hold viewer attention. The talking head becomes a "no no."

What we may have missed by mindlessly applying the rule that forbids talking heads is that some teachers — whether on television or in a classroom — seem able to hold the students' attention without needing additional effects. These individuals live their subject matter. Their passion and appreciation for their subject enhances their presentation and flavors the facts with human feelings. The subject matter *becomes* their experience. Both information and feelings are communicated and, when this is coupled with dramatic ability, the viewer is made part of the experience. (Leo Buscaglia serves as a current example.) In this situation, the television medium achieves what it does best — it links the viewer's mind directly to the presenter's experience.

Whether people talking about their own experiences could hold a viewer's attention was not the only dilemma we faced in putting the modules together. Each 30-minute module was to consist of, possibly, ten to 20 "talking heads" in a sequence designed to indicate patterns or trends in the use of microcomputers by schools. We had to decide whether to use an inductive or deductive approach.

The inductive organizational approach requires the viewer to think about and relate one information segment to another. This method is more like real-life experience in which viewers relate the information to their own situations and get their own "ah-ha!s." Although the inductive model seemed attractive to us conceptually, we also knew that most adults prefer a deductive approach. They want you to tell them what you are going to tell them, tell them, and then tell them what you told them. The deductive model requires less of the viewer.

We decided to combine the two. The content of each module consisted of the actual voices of the people interviewed. Narration and graphics were used to provide: 1) an initial framework to help viewers organize and understand what they would see, 2) transitions between segments, and, in some cases, 3) a summary.

In the end, all four modules consisted primarily of talking heads — exciting, sincere, competent human beings relating their stories. Where cover footage that related to what was being said was available, it was used to support the aural content.

Learnings

As we did with our teleconference experience, we gained some new insights and reinforced old knowledge through the development of the video modules.

Communication or presentation?

Regardless of what visual effects we use, it is what the viewer does with the information that determines whether we are communicating or simply presenting data. For video communication, knowledge of the specific audience is essential — not just who they are, but what their situations are and how this tape relates to them.

Capitalizing on what the viewer brings to the viewing experience.

To communicate effectively, one must grab hold of a "handle" in the mind of the viewer. Videotapes of the type we produced have an advantage over broadcast television — they can be *targeted* communication designed to address conditions or experiences that are already in the viewer's mind. Since the primary audience for our video modules was at the local school level, we chose problems and experiences most local educators would relate to immediately, e.g., parent pressures, feelings concerning students who know more about computers than teachers, troubles in getting the technology to work the way it was supposed to, etc.

One problem with this approach arises when the tape is shown to people who lack the experience that will link and give meaning to the information the videotape presents. Instead of triggering personal pictures of "possibilities" in such a viewer's mind, the tape appears to contain little but computer classrooms and, of course, talking heads.

The "Real" Talking Head

We came away from the Project BEST experience with a new appreciation of the talking head — not only of how effective one can be if it verbally and non-verbally engages the viewer's mind, but also of where the real talking head resides. This "talking head" is the little voice in the head of the viewer — the voice that provides a continuous, running commentary on what is being seen and heard. Ideally, the TV communicator wants this voice to be "in sync" with the information being presented. Communication is blocked when that little voice starts making social commentary or wondering about elements of the picture that have little to do with the message being communicated.

This type of "talking head" continues to concern us. We need to know, for example, when a picture of children using computers in a classroom will enhance what a teacher is saying about his or her particular classroom application, and when it will cause the internal talking head to count the number of girls in the class or make a note of the brand of computer being used instead. There are no easy answers, except to do the hard work of trying to understand what it is like inside the "viewing/listening head." This is the starting point for good video communication.

In summary, we never questioned that videotape could capture the essence of human experience. Our concern was whether the experience could be communicated to and accepted by others. Feedback from our attempts in Project BEST suggests that it can — at times, the eye can be disengaged and the minds allowed to connect. Where interactive telecommunications can link human beings together to exchange experience in real time, so fixed telecommunications media can use stored images to provide links. The only essential requirement is that there be some element of common experience at both ends of the link upon which to construct the video bridge. ☐

Appendix E "PROBMO" - Problem of the Month Bulletin Board

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probmo

??????????????????????????????BEST NET:  PROBLEM OF THE MONTH?????????????????????????????

                                 March 14, 1983

    Which school districts in which states are using an electronic mail service?

    Information requested by Richard Loman, Illinois SEA (Finance).

    Send responses to vb.act using the subject "probmo reply."
    Responses will be posted daily through March 18.

    This bulletin board will be changed weekly.

    MENU for BEST NET Options        RM or RMS to read your mail
    DRAFT to send a message          BYE to finish using BEST NET
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TITLE: GERTRUDE'S SECRETS

VERSION: 1982 AUTHOR: Teri Perl (Design), Grimm and Robinett (Program)

COMPANY: The learning Company, 4370 Alpine Road, Portola Valley, CA 94025

COMPUTER: Apple II or II+

DESCRIPTION: Learning Game of Logic using Piagetian tasks

SUBJECT(s): Problem solving, Critical thinking and Logic

GRADE LEVEL (s): K-4

RECOMMENDATION: 1 (GREAT) Improves Computer Literacy. It can be applied to nearly all subject areas as the problem-solving skills are needed in all of them.

LOCATION(s): Cupertino, Cincinnati

AECT
Network News

AECT Assists U.S. Department of Education in National Conference

On June 22, the U.S. Department of Education presented its concern for the use of the new information technology in education as part of a two-day National Technology Conference in Washington, DC. The presentation, which utilized the various information technologies highlighted in the conference, included a telecast that was aired over the PBS/Confersat Teleconferencing System to 43 participating state sites and numerous other passive viewing sites at PBS stations throughout the country.

U.S. Department of Education Secretary Terrel Bell (left) and Assistant Secretary Donald Senese (right) fielded questions regarding the ED's Technology Initiative during a June 22 interactive teleconference.

Through a federally-funded contract, AECT's Project BEST staff was asked by Department of Education officials to provide planning and logistical and technical support for the teleconference. In addition, Project BEST publicized the telecast through its network of 43 state sites resulting in a viewing audience of over 2500 state and local educators, governors, lieutenant governors, legislators, higher education personnel and private sector representatives.

Secretary Terrel H. Bell and Assistant Secretary Donald J. Senese hosted the conference, which began with a 90-minute telecast that originated at Maryland Instructional Television in Owings Mills, MD. Howard Hitchens, who served as moderator, presented a status report on the use of microcomputers and other new video technologies in the schools; interviewed Bell and Senese on the Department's technology focus; and facilitated the 30-minute interactive portion of the telecast that was aired from 2:00–3:30 p.m. (EDT). During the June 22 interactive segment, both Bell and Senese responded live to questions posed by four state team leaders regarding the technology initiative and its potential impact at the state level. At the close of the telecast, viewers from all participating state sites were invited to call in questions that in turn would be answered on the June 23 regional audio teleconference to facilitate greater interactivity. States were divided into five geographical regions, and each region participated in a one-hour audio follow-up of the preceding day's telecast. Additional Department of Education officials were on hand to assist Senese in responding to inquiries from the states, and Project BEST staff at AECT served as facilitators and rapporteurs for the audio sessions.

A 90-minute ¾″ videotape of the telecast is available for viewing at AECT's national office. It can also be dubbed at cost to individual requestors for use with audiences in their own institutions. We invite interested AECT members to contact Project BEST at (202) 466-3361 for dubbing information and cost figures.

PROJECT BEST SPREADS THE GOOD NEWS ABOUT TECHNOLOGY IN EDUCATION

In October 1981, AECT was awarded a 21-month federally funded contract to work with State Education Agencies (SEAs) in strengthening their knowledge and capacity to use the new information technologies (microcomputers, videodiscs, satellite and hybrid telecommunication media) for educational problem-solving. Known as Project BEST (Basic Education Skills through Technology), this effort focuses on the content areas of basic skills instruction—math, reading, and language arts. It's a cooperative effort involving federal, state, and local governments and the private sector in providing information about applications of this technology to education; and *it actually uses the same technology* to disseminate the information.

Project BEST is a multi-faceted project employing a variety of communications media. These include:

- **Four audio and four video teleconferences.** Running approximately 90 minutes, each teleconference covers key topics and issues that are of concern to SEA personnel regarding the use of technology in education.

- **An electronic information system including electronic mail and bulletin board services.** Each of the participating states feeds into the system information of a practical nature on the use and application of the new information technologies, including any problem-solving· approaches used. Also included is a comprehensive vertical file with references on microcomputer software development and evaluation sources, and information on exchange possibilities.

- **A toll-free telephone hotline.** Scheduled to be operational in October, the hotline will be used to respond to inquiries of a more urgent nature from participating states on technology issues in basic skills instruction.

Who's Involved?

Project BEST has developed a network of both state education and federal regional office personnel who are working within their respective states and/or regions to apply new technology to the teaching of basic skills.

The participation of 43 state sites (including the District of Columbia and Puerto Rico) is being defrayed by the Project over the next 12 months.

Through their participation in Project BEST, states are given access to interactive communication channels that link them to other states with similar concerns and needs, as well as to those states that have made major advances in the use of the new information technology and can thus share their practical experiences. Although the Project BEST effort is targeted at SEA staff, the long-term intent is to build state level capacity so that in turn each state can enhance local school district efforts to use modern information technologies for improvement of educational programs.

Each state team is appointed by the Chief State School Officer, and consists of state level media and technology personnel, basic skills specialists, curriculum staff, dissemination and information science individuals, and educational administration and managment decision makers.

What's On the Agenda?*

1. **Video Teleconferences.** This effort was begun with the Secretary of Education's National Technology Telecast on June 22, and will be succeeded by the following interactive teleconferences:
   - October 27, 1982
     SEA Organization for Effective Use of Technology in its Own Work and to Promote Use in Schools
   - January 24, 1983
     Practices and Examples in Planning, Introducing and Implementing the New Technologies in the Classroom by Basic Skills Content Areas

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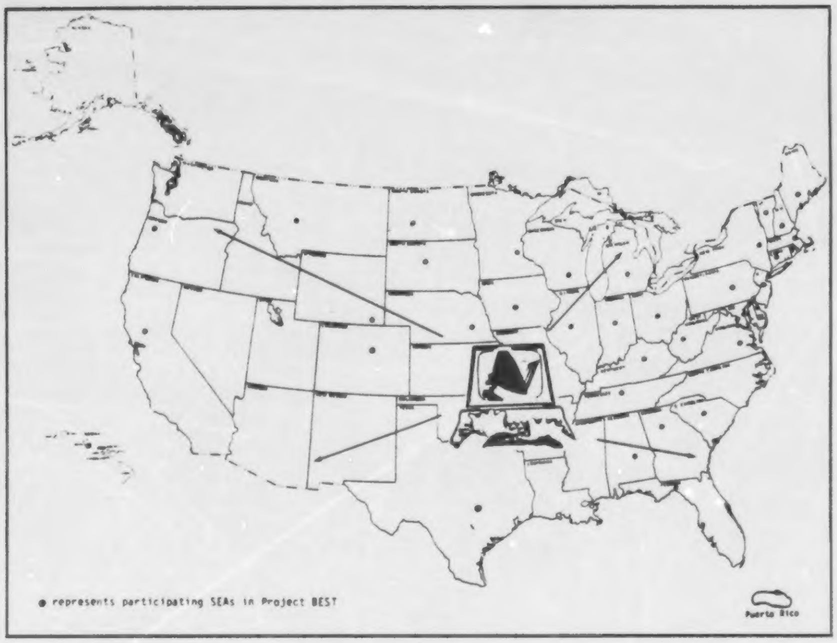
*Profiles and updates of Project BEST activities will appear in subsequent issues of *Innovator.*

- March 29, 1983
  Teacher, Administrator and Parent Literacy in the New Technologies—Illustrative Examples, Issues, Concerns and Promising Approaches
- June 28, 1983
  Guidelines in Software/Hardware Selection and Evaluation — Who's Doing What, How and with What Effects?

2. **Electronic Mail Service.** Initiated on July 30, the system has the following components:
   - message exchange
   - bulletin boards
     —upcoming conferences, meetings, workshops
     —publication citations
     —problem of the month: states share problems, concerns, and successful experiences in implementing technology into their educational programs.

3. **Audio Teleconferences.** Complementing the January 24 teleconference will be three audio teleconferences for each of the basic skills content areas, permitting state team members in each of the respective areas to interact with their counterparts on the application of insights gained from the January 24 teleconference.

4. **Video Tape Training Modules.** Eight video modules will be developed as part of the four video teleconferences. They will be made available to the SEAs for later use in SEA training programs, and will underscore innovative and exemplary approaches to the use of information technologies.



5. **Telephone Hotline.** This toll-free service will be available in October to respond to problems of an immediate nature.

Project BEST and AECT—Where Do You Fit In?

Under the terms of the Department of Education Contract, Project BEST relates primarily to State Education Agency personnel responsible for teaching/learning activities at the K-12 grade levels. However, recognizing that many AECT members are faculty or staff at institutions of higher education (IHE), we are concerned that the Project also have ramifications at that level. There are several possible areas of involvement by AECT members, particulary those at colleges and universities:

- IHE representatives are participating on the various Project BEST state teams providing input in the areas of teacher education and media/telecommunications. IHEs are also administrative units of SEAs in some of the Project BEST participating states, and consequently can access the various project technology and information resources directly.
- Teacher inservice requests are likely to be generated as a result of project topics, and higher education staff sought to provide collaborative teaching arrangements.
- Several software exchange systems are being facilitated by our colleges and universities.
- Products (videotapes of exemplary practices, teleconferences, and printed materials) and residual data from the information service component of the Project can be made available to AECT members to assist in their professional efforts as an additional benefit of membership in AECT.

We also encourage all AECT members to contact their Project BEST State Team Leaders to determine how to become more directly involved in their States' uses of Project BEST resources within specified State Technology Plans.

Project BEST Directory

Participating States

Participating State Education Agencies and state team leaders working with the Project BEST effort include the following:

Alabama	Ron Wright
Alaska	Bill Bramble
California	Mary Reed
Colorado	Robert Ewy
Connecticut	Elizabeth Glass
Delaware	William Geppert
Florida	Jack Binns
Georgia	Bill Hammond Nancy Hove
Hawaii	Rose Yamada
Illinois	Carolyn Farrar
Indiana	Phyllis Land
Iowa	Erik Eriksen
Kentucky	Joseph Clark
Maine	Richard Riley
Maryland	Richard Petre
Massachusetts	Stacey Bressler
Michigan	Wayne Scott
Minnesota	Robert Miller
Montana	Duane Jackson
Nebraska	Bob Beecham
New Hampshire	William Ewert
New Jersey	Stephen Koffler
New York	William Halligan
North Dakota	Ethel Lowry
Ohio	Irene Bandy
Oregon	James Sanner
Pennsylvania	William Isler
Rhode Island	Donald Gardner, Jr.
South Carolina	S. Kemble Oliver, III
South Dakota	Joyce Levin
Tennessee	George Malo
Texas	Marvin Veselka
Utah	Kenneth Neal
Vermont	James Lengel
Virginia	M. Kenneth Magill Mary E. Dalton
Washington	Joan Newman
West Virginia	John Pisapia
Wisconsin	Dianne McAfee Hopkins
Wyoming	Alan Wheeler
District of Columbia	Reuben Pierce
Puerto Rico	Sylvia Acevedo

Advisory Committee

Project BEST has an Advisory Committee made up of the following individuals and organizations. The committee works closely with AECT and the Project BEST staff in carrying out the contract requirements for the Department of Education.

American Association of School Administrators—William Spady, Director
Association for Educational Data Systems—Sylvia Charp, Representative
Association of State Supervisors of Mathematics—Barbara Wickless, President
Basic Skills National Technical Assistance Consortium—Harriet Doss Willis, Director
The College Board—Adrienne Y. Bailey, Vice-President for Academic Affairs and Director, Project Equality
Council of Chief State School Officers—William F. Pierce, Executive Director
Education Commission of the States—Shirley McCune, Director of State Services Division
ERIC Clearinghouse on Information Resources—Donald Ely, Director
International Reading Association—Ralph Staiger, Executive Director
National Association of State Educational Media Personnel—Paul Spurlock, President
National Association of State English and Reading Supervisors—Bill Hammond, Past President
National Council for Accreditation of Teacher Education—Lyn Gubser, Director
National Council of Teachers of English—Bernard O'Donnell, Projects Coordinator
National Council of Teachers of Mathematics—James D. Gates, Executive Director
National Governors' Association—Joan Wills, Director
National Science Foundation—Carole Ganz, Special Assistant to the director for Program Assessment
National Steering Committee of State Basic Skills Project—James R. Smith, Representative
State of Pennsylvania—Robert Scanlon, Secretary of Education

AECT Project BEST Staff

Project Office: (202) 466-3361

Henry Ingle—Project Director
Cheryl Petty—Senior Project Associate
Tim Fay—Consultant
Terry Skura—Program Assistant
Barbara Sheridan—Administrative Assistant

October 27—Another Big Day for Project BEST—What's Involved

by Henry Ingle and Cheryl Petty

On October 27, 1982, from 1:30–3:30 p.m. EST, the 43 Project BEST state sites will convene for the first of a series of four video and four audio teleconferences that deal with the application of the new information technologies in education. The October teleconference will focus on organizing State Education Agencies to effectively use the new technologies for their own work, and in assisting schools to use these technologies in areas such as basic skills instruction. The effects of technology on organization and conversely, organization on technology use, is a topic that is pertinent to media professionals as well as others in education.

The teleconference will be divided into three segments:

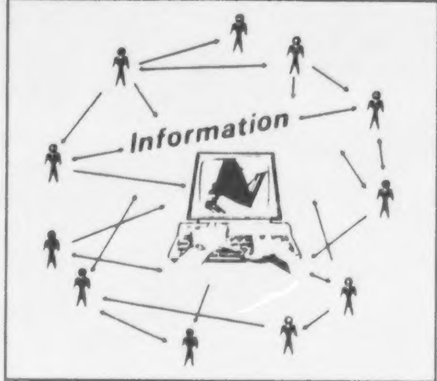
- **A discussion by panel of state level educational decision makers who will present the oranizational issues that were derived from their experiences**
- **A 40-minute audio-only interactive segment in which the states, divided into four groups, will exchange their ideas for responding to the issues**
- **A synopsis of the audio work session groups followed by a period during which participants within the 43 state sites will be invited to call in questions to the panelists. Calls will be accepted up to one hour after the teleconference goes off the air.**

The teleconference, like the other components of the project, will rely on the combined skills of a variety of individuals, including professionals from two subcontracted agencies, Applied Management Sciences, Inc. (AMS) of Silver Spring, MD, and the Maryland Instructional Television (MITV), that play a major role in the conduct of BEST. The following individuals constitute the Project BEST staff.

AECT

With advanced degrees in education and communication, and more than 15 years of experience in the field, **Henry Ingle**, along with Lew Rhodes, is researching the major program content for the upcoming teleconferences. Henry holds principal responsibility for administration and management aspects associated with implementing all Project BEST activities for AECT.

Through the information exchange of electronic mail system and the project's extensive data base, **Cheryl Petty** will retrieve information relevant to the topics of the October teleconference and develop the pertinent print support materials. As Senior Project Associate, Cheryl coordinates and supervises the user information services and research components of the project.



Tim Fay is coordinating the technical aspects of the electronic mail and the interactive audio component of the upcoming teleconferences. He also plays a key role in the planning and design considerations for the format of each teleconference.

Coordinating the site selection and interview procedure for the video modules that will accompany the upcoming teleconferences is Program Assistant **Terry Skura.** Terry previously worked as Public Information Coordinator of handicap employment issues for Mainstream, Inc.

As Administrative Assistant to the Director, **Barbara Sheridan** coordinates the information and resource center at the project's office, and handles logistics and administrative activities for the project staff. Barbara's background is in library and educational media.

AMS

Director of Applied Management Science's Communications and Training Division, **Lewis Rhodes** serves as Associate Director for BEST, and works jointly with Henry in designing, researching, and implementing the various programmatic phases of the project. Lew is responsible for issues papers development, coordination of panel activities, and a major portion of content for the October teleconference.

Carol Baker coordinates the evaluation component of the project and works closely with Henry and Lew during the various design and conceptualization phases. She will be developing print support materials for use at teleconference reception sites, and works with Terry in the selection of school systems to be included in the video modules.

MITV

The October teleconference will originate from the studio at MITV in Owings Mills, MD, under the supervision of **Dolores Deardorff**, Branch Chief for Instructional Television at MITV. As Associate Director for Production for Project BEST, Dolores works with Henry to explore and design creative production techniques that will enhance the delivery of the teleconference issues.

Leroy London, Instructional Designer at MITV, coordinates the logistics for the satellite uplink and downlink between MITV and the various reception sites. He is developing the procedures for the audio call-ins during the interactive portion of the October teleconference.

The Executive Producer for the upcoming teleconference is **Frank Batavick**, who has produced teleconferences since 1977. He will oversee the production process for the teleconference and a series of informational video modules.

Anne Jarell-France, producer of the Project BEST video components, has been with MITV for two years producing the Basic Skills Mathematics series, *Counterplot*. She has also produced the award-winning weekly national series, *Consumer Survival Kit*.

Field Director/Producer **Charles Bokor** will be working in the control room as Assistant Director during the October teleconference. He will also produce, direct, and edit the video modules that will accompany upcoming teleconferences.

January 24—Red-Letter Day for Project BEST!

On January 24, Project BEST will hold its second teleconference during the Third General Session at the 1983 AECT annual convention.

The 90-minute video conference with audio interactivity will be carried over the Public Broadcasting Confersat System, beginning at 1:30 p.m. (CST), and will deal with current project experiences in grades K–12 on the subject of introducing and planning for the new information technologies.

The session will include a panel of leading private sector representatives reacting to current experiences, and exploring concrete ways in which private/public sector cooperative arrangements can be profitably stimulated to assist teachers and administrators in the process of "getting started."

State team members from 41 state departments of education participating in Project BEST, and participants at the New Orleans Superdome, will be linked together via satellite telecommunications. Building on the experience of several sites across the country, which BEST will document on videotape, and using a panel of industry resource people assembled at COMMTEX International, the videoconference will identify and discuss alternative planning approaches for technology use under varying conditions.

Project BEST team leaders and the resource panel will exchange perspectives and information to:

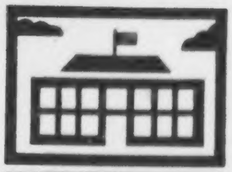
- identify strengths and weaknesses of current planning approaches for introducing the new technology
- become aware of potential benefits, problems, and difficulties that surround private/public efforts

Also on the agenda is the subject of expectations and misperceptions that the public and private sectors have regarding each other.

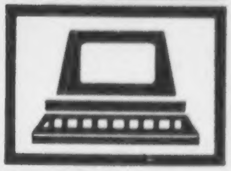
Conference participants will identify specific ways in which SEAs, employers, vendors, publishers, and other industry groups can facilitate and complement each other's efforts in planning, introducing, and implementing the new technologies at the school level. They will also explore such topics as budgetary, hardware/software, human, and informational resources that the public and private sectors can contribute to ease the implementation of technology. The primary objective of the teleconference is to create opportunities for states to obtain new insights and information that can guide the development of planning models for introducing and implementing the new technologies at the school level.

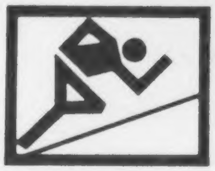
The teleconference will also present highlights of selected program activities and exhibits at the AECT Conference and COMMTEX International. Thus, educators throughout the country who are unable to attend the convention can still experience this exciting event as it evolves. Contact your Project BEST State Team Leader, or call the Project BEST office (202/466-3361) for viewing information.

January 24—Mark your calendar NOW. If you can't be at the convention in person, perhaps you'll be able to link up to the Project BEST teleconference!



SCHOOLS AND THE NEW TECHNOLOGY





THE GETTING STARTED PROCESS

The latest and most discussed newcomer to the growing family of educational media and technology is the microcomputer. It has become the number one topic of concern for a large number of educators and media specialists at all levels of the educational system. On January 24, Project BEST, in the second of four planned video teleconferences, is exploring the process of "getting started" with this new technology, in a video presentation that will document the current experience of several school sites across the country.

Entitled **"Getting Started With the New Technology: Current Classroom Practice and Experience,"** this second teleconference will originate live at 1:15 p.m. (CST) from the Superdome at the COMMTEX International Exposition in New Orleans. It will include a segment of questions and answers between the 41 teleconference viewing sites and a panel of private and public sector representatives who are assembled at COMMTEX to view the video case presentations and discuss realistic ways in which state departments of educations and the private sector can help school districts with the "getting started" process.

The opening segment of the teleconference will provide an overview of convention events, highlighting principal COMMTEX Exposition and AECT Conference activities related to the new technology. Following this brief overview, a pre-recorded video case presentation will be aired that documents the "getting started" process, as experienced in schools in Fairfax, VA ; Ann Arbor, MI; Plains, MT; Cincinnati, OH; Albany, OH; and Cupertino, CA. These sites were nominated earlier by Project BEST State Team Leaders as those involved with the use of the microcomputer to teach basic skills and computer awareness to school-aged children. The video case presentation runs 40 minutes, and will be made available to each Project BEST participating state education agency for use in its respective training and technical assistance program.

Following the video case presentation, staff "roving reporters" will solicit live, on-camera reactions to this module from the state and local educators and AECT convention participants (including State Team Members), who are viewing the teleconference at the Superdome.

A panel of representatives from the private sector will also appear on the teleconference reacting to the video module with suggestions for enlisting the help of the private sector for teachers, school administrators, librarians/media specialists, or others concerned with the best implementation of computers in our schools.

At the conclusion, there will be approximately 20 minutes of live, on-air interaction time during which private sector representatives and selected state and local educators will receive calls from viewers assembled at state sites across the country about getting started with the new technology. The teleconference will end at approximately 2:55 p.m. (CST).

This second Project BEST teleconference is designed to clarify the factors involved in implementing the new technologies, particularly the microcomputer, into the schools, and also the various roles state education authorities and the private sector can play. It will demonstrate flexible uses of dissemination procedures using viewer-panel interaction, and documented, real-life experience in videotaped formats to communicate current ideas and concerns that educators are expressing about implementing the new information technologies.

If you are interested in participating in the January 24 teleconference in your state, contact your Project BEST State Team Leader, or call Henry Ingle at the Project BEST office in Washington at 202/466-3361.

If you plan to attend the AECT Conference in New Orleans, join us in the Superdome for this major session, which is brought about through the Education Department contract with Project BEST, and cosponsored by AECT and the National Audio-Visual Association (NAVA).

January 24 Teleconference Schedule

1:00 p.m. (CST)	COMMTEX Audience Assembled to Witness Ceremony Honoring Secretary Terrel Bell (concurrently running bars and tone on the PBS stations)
1:15 p.m.	Introduction of Teleconference and Overview of the Day's Activities
1:25–2:00 p.m.	Video Module: Getting Started with the New Technology in Schools—The Microcomputer
2:00–2:10 p.m.	Interview with Selected SEA and LEA Viewers in the Audience
2:10–2:20 p.m.	Comments on How the Private Sector Can Help
2:20–2:55 p.m.	Call in from States for Private Sector, SEA and LEA Representations
2:55–3:00 p.m.	Closing

Questions and Answers on the B.E.S.T. Approach to Electronic Mail

by Cheryl Petty

In August 1982, Project BEST (Basic Education Skills through Technology) instituted its electronic mail system—BEST NET. The purpose of BEST NET is to (1) provide participating State Departments of Education with a first hand experience using the technology of electronic mail and (2) facilitate the exchange of current information that is useful to the content and requirements of Project BEST and individual state technology activities in education in as easy and rapid a fashion as possible.

Q: What is electronic mail service (EMS)?

A: Quite simply, electronic mail is information that people transmit and receive over reserved telephone lines connected to one or more designated computer terminals (and/or microcomputers) and ancillary printing and video display equipment. In this manner, information may be conveyed in a matter of minutes. The length of the message can vary from one or two words to several pages and the content may cover a range of issues, concerns and work activities.

Q: How does it work?

A: Electronic mail requires a computer terminal and a modem that will permit access to the host computer by direct dial telephoning or via Telenet or Tymnet (these are cost saving long distance services for computer communication). When using a microcomputer for EMS, communications software may also be necessary.

Q: What are the information features of electronic mail?

A: Messages can be sent to one person, several persons or everyone on the network. In addition to "mail" services, EMS offers such features as electronic bulletin boards on a variety of subject matter areas, and computer conferencing. It permits procedures such as Delphi polling among users as well as the giving and receiving of immediate feedback for requests that carry short deadlines for answering, and/or the need for multiple responses from a wide array of perspectives or sources.

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Welcome to the
BEST NET Electronic
Mail Network
(NOTE: You have new
mail to be read!)

Q: Why BEST NET?

A: There are a number of electronic mail services available for those who have access to a computer. A limited number of these services are targeted at educators. BEST NET has been specifically tailored to address the needs and concerns of state education agency personnel working with the new information technology and its applications to basic skills instruction. BEST NET offers its users an opportunity to share experiences, exchange ideas and request resources and materials from other users. BEST NET is an interactive tool that permits messages to be answered on the system in the same manner in which they are sent. Here is an example of a message exchange:

251 Wed. 11/10/82 15:06 From vb.a46
"wyoming" 17 lines

How are colleges of education in each of your states approaching microcomputer training in pre-service programs. Interested in names, addresses of contact people who can answer questions such as what level of computer literacy is or should be expected? are specific courses required? budget allocations? college role in inservice education?

To: vb.08
cc: vb.act

276 Tue. 11/23/82 09:48 from vb.a19
"iowa": college preservice/inservice programs

Forwarding directory of contact people for Iowa's teacher preparing institutions. Persons named therein can answer your questions regarding preservice programs, literacy levels, etc.

To: vb.a46
cc: vb.act

Q: Who's using BEST NET?

A: BEST NET serves as a message and information resource for 41 state education agencies, the U.S. Department of Education and the Department's ten regional dissemination offices. Dr. Elwood Miller, AECT President, also has access to BEST NET. In addition, several other organizations have become a part of the Project BEST NETwork. These organizations are assisting the project in meeting the needs of the state departments of education in a variety of ways. The Urban School Superintendents Task Force, initiated and supported by NIE, was established to assess technology concerns in large urban school districts. The Northeast Regional Education Exchange (NEREX) has been actively working with the New England states in technology and other educational concerns. EduTech is a federally funded project that disseminates information regarding the use of the new information technology in special education. Resources in Computer Education (RICE) is a new data base system developed by the Northwest Regional Education Laboratory that offers searches and retrievals for microcomputer courseware packages and manufacturers. State Team users are entitled to three complimentary searches on RICE as part of their participation in Project BEST. ERIC/Information Resources at Syracuse has offered to provide each participating state BEST NET user with a diskette of current ERIC searches regarding the use of microcomputers and videodisc technology in education, teleconferencing, hardware and software evaluation and other timely topics as part of their participation in the project. As network users, these groups may respond directly to inquiries from participating states. Thus the network does not amass information and knowledge at any one central place or depository, but rather "brokers" educational technology information seekers and information providers wherever they may be. BEST NET, therefore, is an information accessing and distribution utility source.

Q: What information is on BEST NET?

A: There are five bulletin boards currently on BEST NET. They have been developed jointly with Project BEST participating states to provide information about current topics, problems and issues in using the new technologies for basic skills instruction in particular and education in general.

CONFER lists upcoming conferences, workshops and seminars being held around the country related to the new information technology as well as teacher and administrator professional association meetings. The CONFER bulletin board is updated weekly with listings at least one month in advance.

From our information data bank and library of articles, books and other resources about computers, cable and videodisc technology and applications in education, we have developed a bibliographic bulletin board of current readings known as BIBLIO to BEST NET users. EduTech, a federally funded project located in Annandale, Virginia, and aimed at investigating technology applications in special education, has collaborated with us to provide data for the BIBLIO bulletin board. Every two weeks a particular subject area is identified, typically to support the topic surrounding an upcoming teleconference or one which has been cited as a topic of interest by Project BEST state teams. The literature is searched, and articles are chosen that have relevance to the particular subject area. Previous BIBLIO topics included computer literacy, uses of the microcomputer to teach reading and language arts, getting started with microcomputers, and seeking funding support. Future BIBLIO boards will include updates on computer literacy, hardware and software selection, evaluation of software programs, software exchange programs, videodisc technology and education, cable and education and much more.

Prior to each teleconference a bulletin board is set up to convey information about the activities of the teleconference and up-to-the-minute details and requests in preparation for the event. Each teleconference bulletin board is labelled by the date of the event, e.g., JAN 24 was the heading for the information board about the January 24 teleconference that originated in New Orleans.

The NEWS bulletin board displays current events in technology that may be of interest to BEST NET users. The availability of a toll-free software hotline number was made known in this listing. Other interesting items included a student and teacher technology exchange program, and awards in technology applications in education, just to name a few.

The PROBMO bulletin board solicits exchange of ideas regarding a current concern or issue in applications of technology to education. Each week a problem is posed dealing with an issue surrounding the upcoming teleconference. Users respond to the problem by sending a comment to the Project BEST "mailbox." These comments are posted twice each working day.

Thus BEST NET exemplifies the "people-to-people" approach of Project BEST by bringing people together on a daily or weekly basis with the aid of an electronic message system. Information can be exchanged and problems addressed within a matter of minutes with the aid of this technological tool. Electronic mail has further implications for school districts and state departments of education as they set up necessary links for technical assistance and information exchange. The versatility of the system permits its use by both large and small school systems, and it can be adapted to meet individual user needs. For further information about BEST NET and the electronic mail system, contact the Project BEST Office (202) 466-3361, or if you are in one of the 41 states participating in Project BEST, contact your respective State Team Leader (listing in September issue of INSTRUCTIONAL INNOVATOR). The BEST NET system is an experimental service that will be available through the duration of Project BEST, scheduled to operate through September 1983.

"BEST NET offers its users an opportunity to share experiences, exchange ideas, and request resources and materials from other users."

Selected short readings on electronic mail:

1. Dahmke, Mark. "Electronic Mail: The Paperless Society Is Still Far in the Future." *Popular Computing,* July 1982.
2. Klein, Stanley. "Now the Electronic Newsletter." *The New York Times,* Sunday, March 14, 1982.
3. Koughan, Martin, "Electronic Mail: Very Special Delivery." *Channels,* Nov/Dec 82.
4. Latham, Glenn. "Enhancing Communications Using an Electronic Mail System." *Technology Literature Review.* Developed by Intermountain Regional Resource Center, January 1982.
5. Rothfeder, Jeffrey. "Electronic Mail Delivers the Executive Message." *Personal Computing,* June 1982.

"Becoming Literate with the New Technology" Project BEST Teleconference—May 18

May 18 Teleconference Schedule* (EST)

2:15p.m.-2:30p.m.	Color bars and tones to adjust/tune monitors.
2:30p.m.	Opening/overview of teleconference topics
2:35p.m.	Introduction of invited guests.
2:37p.m.	Presentation of video module segments, call-ins, and discussion.
3:15p.m.	Interactive segment on "Feedback and Significant Learnings"
3:30p.m.	Closing

*On May 17 participating states will receive a 30-minute videocassette and video newsletter (transmitted via PBS on a closed-circuit basis) for screening by state site participants as the first order of business at each state meeting being convened in conjunction with the May 18 teleconference.

As the number of computers increases in schools across the country, the question inevitably arises: just how much do I need to know about this new information technology? During initial research efforts in Project BEST, we found that one of the major issues educators at both the state and local levels want addressed is clarification on computer literacy—what it is, who needs it, and how do you do it? In response to this request for information concerning computer literacy, the third Project BEST teleconference is entitled "Becoming Literate with the New Technology." It will originate in Owings Mills, Maryland, from the studios at the Maryland Instructional Television Division, Maryland State Department of Education on the grounds of the Maryland Center for Public Broadcasting (PBS Satellite Transponder 9, WESTSTAR).

Each of the previous BEST teleconferences has used a different format as part of the Project's experiment to use telecommunications to learn about the new information technologies. The May 18 teleconference is no exception. This teleconference will involve several discussion segments with school practitioners on the issue of becoming literate with the new technology, focusing primarily on the microcomputer. Training strategies for administrators, school staff, students, parents, and educators in general will form the nucleus of the teleconference.

As a prelude to the May 18 teleconference, a 30-minute prerecorded videocassette will be transmitted to the designated reception sites during the morning of May 17. This module will document the current experiences and concerns of practitioners at six school sites around the country. Project BEST state teams will be asked to view the video module beforehand and to prepare pertinent questions dealing with the issues presented in the module, which can be addressed during the May 18 teleconference. A "video newsletter" will also be transmitted with the video module on May 17. The newsletter, a ten-minute presentation, will highlight new products, materials, projects, and experiential information from the federal, state, and local levels.

The one-hour interactive teleconference on May 18 will be beamed via the PBS satellite service at 2:30p.m.(EST). The teleconference will explore ways that team members and invited participants can use the video module in their states to provide technical assistance and information to local school personnel. Selected short segments from the video module will be used to focus call-in questions from viewing sites to assist states in developing strategies for use of the module with local education agencies. Topics of discussion will include:

- Should computer literacy be a mandatory or elective activity?
- When does one become literate and what specific criteria should be used to assess literacy?
- Who should lead the computer literacy effort? Who should provide instruction/training?

The teleconference will also include a short segment containing significant learnings and constructive feedback concerning Project BEST teleconference presentations to date, as well as information on the way states are using other Project BEST products and services.

If you are interested in participating in the May 18 teleconference in your state, contact your Project BEST state team leader or call Henry Ingle at the Project BEST office in Washington at (202) 466-3361.

"The Feeling is Mutual" School/Industry Cooperation

by Carol Wolinsky and Henry Ingle

The potential for public-private cooperation, particularly in the field of educational technology, was explored in the January 24, Project BEST teleconference, which originated from the AECT convention in New Orleans.

The teleconference included a segment of interviews with educators in five very different communities: Fairfax County, Virginia; Plains, Montana; Cincinnati, Ohio; Albany, Ohio; and Ann Arbor, Michigan. Lessons learned from these five school sites include the following:

- In terms of school cooperative arrangements, the private sector can include local business firms, employers, "high-tech" industry, parents, students, and the community in general.
- Schools should work with several firms or companies, involve them early in the process, and include the school's top level leadership
- In contacting the private sector for support, administrators should identify aspects of their school program or plans likely to provide mutual benefits
- Private sector support means more than just hardware and software donations. It also means ideas, expertise, outside consultant help, and technical assistance.

Teleconference Panelists, from left to right: Michael Odom, Chris Bowman, Pauline Jordan, and Glen Polin.

A panel of experts from firms in high technology industries answered questions called in from viewers at 41 participating sites. Panel members included:

- Mr. Chris Bowman, formerly National Mangaer of Educational Marketing at Atari Computers, and now with Apple Computers;
- Dr. Pauline Jordan, Corporate Manager for Learning Technologies at General Electric;
- Mr. Michael Odom, from Digital Equipment Corporation, who is on loan to two school systems in Massachusetts; and
- Mr. Glen Polin, Manager of Educational Market Development for Apple Computers.

One difficulty schools face in trying to establish a cooperative relationship with the business community is not knowing how or where to begin. Panel members offered several suggestions for schools that want to initiate relationships with the private sector. They all agreed that an essential element was for schools to approach industry with specific, well-defined proposals rather than generalized requests for help. In cases where districts lack the experience to develop proposals, Michael Odom recommended asking local industries how the schools could assist them, and requesting help with a needs assessment. Panelists suggested involving a wide variety of industries who have had experience using technology rather than relying solely on vendors of computer hardware and software.

Pauline Jordan commented that it is sometimes easier to interest individuals in a firm to help the school than it is to approach the company as a corporate entity. Individuals have an interest in schools because they are members of the community, tax payers, and, perhaps, parents of students in the system. They are often delighted to volunteer their time to work with staff and students.

Glen Polin emphasized the importance of working with local firms rather than seeking help form vendors in distant locations. This point was reinforced in interviews with school personnel from five communities across the United States. They cited the following examples of obtaining help from local resources:

- A committee of representatives from local firms that use computers reviewed the school district's computer resources and needs and assisted in obtaining school board support for a major computer initiative.
- Local firms have agreed to "adopt-a-school" and have helped to develop computer-related vocational programs in the schools.

Many of the suggestions offered were appropriate to communities that have a large number of high technology firms; however panelists indicated that small, rural communities not located near major hardware or software vendors could also find help. Odom recommended working with firms that are users of technology rather than hardware vendors. He suggested that banks, insurance companies, military facilities, and local telephone companies could provide assistance. If these types of firms are not located in the area, he recommended approaching large chains located elsewhere in the state. Pauline Jordan suggested contacting local firms that advertise on television.

An important ingredient in establishing a successful cooperative relationship is that both sides must benefit—teaching students skills that are valued by employers, providing an opportunity for vendors to pilot test hardware or software, increasing teachers' and students' awareness of industry needs and industry's understanding of the schools—these are the types of positive approaches that seem to work best.

Members of the Project BEST staff have prepared a paper that outlines some of the issues in public-private cooperation in the use of high tech in the schools. Contact Project BEST (1126 16th Street, N.W., Room 214, Washington, D.C. 20036) for a copy.

Project BEST: What is it? . . . Who's Involved? . . . And How Are States Benefitting?

Henry T. Ingle*

What Is It?

Late in the Fall of 1981, the U.S. Department of Education awarded a competitive two-year contract to the Association for Educational Communications and Technology (AECT) in Washington, D.C. Its purpose is to facilitate the exchange among State Departments of Education of current practitioner experiences and insights on the use of technologies, such as the microcomputer, for application to basic skills instruction. Hence, the acronym, B.E.S.T.–Basic Education Skills through Technology.

In providing this assistance to State Education Agencies, which in turn assist local schools, Project BEST makes use of audio and satellite video teleconferencing, a series of videotaped modules on current technology school practices, print support materials, and an electronic mail system (BEST NET) interconnecting 41 participating states on microcomputers. BEST NET is used for problem-solving, information exchange, and the sharing of reference resources and personal/professional experiences with these new information technologies. The use of microcomputers and related telecommunication technologies, as integral parts of Project BEST, are designed to explore concrete applications of these tools for maintaining professional communication among state educators in an era of dwindling travel budgets for staff development and increasing pressures for staff to better understand the administrative and instructional applications of these new tools.

Project BEST is working through State Teams composed of personnel from the basic skills, in-service training, and technology management units of their agencies, as well as other units state officials have designated. Strengthening the SEA's ability to utilize advanced telecommunications technology, and increasing their awareness of successful applications in the field, is expected to enhance their efforts to reach out and assist local education agencies and schools trying to utilize these various new technologies.

For this purpose, a variety of products and information services are being developed and made available to the State Teams through Project BEST. These include:

- modules of written and video materials on the use of technology in basic skills education, including materials to support planning, administration, and instruction;
- a series of video and audio interactive teleconferences to present information on successful applications in the field and to permit participants to interact with each other and to query other practitioners and experts about these activities; and
- a current body of information accessible through such means as an electronic mailbox, telephone or regular mail. Included in this information bank are:
  (1) news notes on upcoming conferences, workshops, seminars, meetings, etc. on basic education skills and/or the new information technologies;
  (2) names of local educators and experts who can be contacted for assistance; and
  (3) bibliographic citations of recent materials on new communications technology, the use of technology in education, and the application of technology both to education concerns in general and to basic skills education, in particular.

In short, Project BEST is serving as a "brokerage" or focal point among participating State Departments of Education for both the exchange and application of the most current information on methods, procedures, processes and materials associated with the use of educational technologies such as the microcomputer. In so doing, it is providing both *opportunities* and *reasons* for State Departments of Education to communicate not only with each other but across their own internal departmental units. In the process significant learnings and personal experiences are being documented and shared which are vital to the application of technology in education.

Who's Involved?

Forty-one State Departments of Education (see attached listing) have been selected for involvement in the project. Each State has formed a State Team of relevant individuals who can benefit from participation in the project and can contribute to the development of project materials and to the expansion of state capability to deal with educational technology. Each participating state, therefore, has assembled a team of the individuals most appropriate to its needs and organizational structure. Individuals representing the following units/organizations are participating on these State Teams:

- Educational media/technology services;
- Basic skills content areas;
- Dissemination, diffusion and innovation;
- Information and library sciences;
- In-service training;
- Coordinators of special computer projects;
- Teacher associations;
- Intermediate school districts; and
- IHEs involved in pre-service and in-service teacher training.

**Henry T. Ingle is Director, Projects Division, Association for Educational Communications and Technology, Washington, D.C.*

A listing of participating SEAs include:
State and Designated Team Leader

Alabama, Ron Wright
Alaska, Bill Bramble
California, Frank Wallace
Colorado, Dr. Fred Jurgemeyer
Connecticut, Elizabeth Glass
Delaware, William J. Geppert
District of Columbia, Reuben Pierce
Florida, Jack Binns
Georgia, Bill Hammond
Hawaii, Rose Yamada
Illinois, Carolyn Farrar
Indiana, Phyllis Land
Iowa, Erik B. Eriksen
Kentucky, Joseph T. Clark
Maine, Richard K. Riley
Maryland, Dr. Richard M. Petre
Massachusetts, Susan Foote
Michigan, Wayne R. Scott
Minnesota, Robert H. Miller
Montana, Duane Jackson
Nebraska, Bob Beecham
New Hampshire, William Ewert
New Jersey, Stephen Koffler
New York, William Halligan
North Dakota, Ethel J. Lowry
Ohio, Irene G. Bandy
Oregon, James W. Sanner
Pennsylvania, William Isler
Puerto Rico, Sylvia Acevedo
Rhode Island, Donald R. Gardner, Jr.
South Carolina, S. Kemble Oliver
South Dakota, Joyce Levin
Tennessee, George Malo
Texas, Marvin Veselka
Utah, Kenneth L. Neal
Vermont, James Lengel
Virginia, M. Kenneth Magill
Washington, Joan Newman
West Virginia, Dr. Norma M.K. Roberts
Wisconsin, Dianne McAfee Hopkins
Wyoming, Alan G. Wheeler

Indirectly, many other individuals at the state and local level are involved in Project BEST. These are individuals invited to attend one or several of the teleconferences conducted by the project and individuals who participate in subsequent SEA-directed training sessions that incorporate Project BEST materials. Thus, the project serves two different audiences: individuals who will serve as trainers and linkers, and professional individuals who will be the ultimate recipients of training and development efforts. The materials developed by Project BEST are being designed to respond to different needs of each target audience.

The other groups indirectly involved in Project BEST, although they are not specific target audiences, are: the U.S. Department of Education and the following professional associations that are cooperating in the project as members of an Advisory Board:

- American Association of School Administrators
- Association for Educational Data Systems
- Association of State Supervisors of Mathematics
- Basic Skills National Technical Assistance Consortium/CEMREL, Inc.
- The College Board
- Council of Chief State School Officers
- Education Commission of the States
- ERIC Clearinghouse on Information Resources
- National Association of State Educational Media Professionals
- National Association of State English and Reading Supervisors
- National Council of Teachers of English
- National Council of Teachers of Mathematics
- National Governors' Association
- National Science Foundation
- National Steering Committee of State Basic Skills Coordinators
- National Council for Accreditation of Teacher Education

How Are States Benefitting?

A feeling commonly voiced by participating State Departments of Education is that Project BEST truly is evolving into a user or need-oriented information exchange service assisting them in solving current, immediate and specific technology utilization problems of relevance to them. The usefulness of Project BEST, from the state perspective, largely focuses on the extent to which the people within the information receiving organizations feel that their needs, idiosyncracies, modes of operation, etc. are being met through a series of communication activities involving audio conferencing, electronic mail, regular mail, and the telephone mix of media and technology the Project is defraying for each state.

The common reactions from the states about the Project and its efforts to date suggest that where BEST is having the greatest impact, the following factors are prevalently cited.

- Educators and administrators within State Departments of Education that heretofore did not communicate and work with each other, or who did so infrequently, are being brought together in a meaningful and highly successful way to identify problems and plan for their solutions. Largely, these meetings are scheduled around BEST teleconferences and/or follow-up activities stemming from BEST teleconferences (audio and video) and/or in response to Project requests for information via the electronic mail system and/or printed memoranda, issue papers, and/or content priority ranking activities.
- A consensus as to the importance of a state technology plan has evolved that permits SEA staff to develop their own sense of control over the use and determination of project services and products, content areas addressed, etc. in line with their specific state plans for the educational application of these new information technologies.

It is also clear from the feedback received from the participating SEAs that they are developing direct "hands-on" experiences with the new technologies. As a result of their direct first hand exposure to the Project BEST telecommunications network, they are beginning to modify previous myths about technology and to develop more realistic insights about current and future educational technology applications.

For example, one of the biggest barriers to acceptance of technology is the assumption (expressed by those who promote and sell technology) that the reason to use it is that if you do it right, "it works without a hitch." Yet, this runs counter to the almost universal experience that things frequently don't work smoothly (from space shuttles, to cars, to film projectors). Through its experimentation with various mixes of technology and information delivery modes, Project BEST is allowing the participants to know that *their* experience is *right*; and that the reason to use technology is not because it will bring perfection, but because it can allow them to accomplish something that is *important* to them. Only against this criterion do the "problems" of technology-use become worth it. In other words, technology does not always work the way it is supposed to . . . but people don't either. But in the latter case, we assume that we can allow for it, and make adjustments when it happens. Consequently, Project BEST is showing technology in an array of settings (some more successful than others) and preparing users to accept and understand both conditions for technology and to expect things to go wrong sometimes. In the process, participating state educators are beginning to understand how to handle such situations and to develop appropriate contingency solutions.

Positive state reactions to BEST focus largely on those efforts of the project staff to *package and disseminate knowledge in the process of being developed.* Where the Project has established the most credibility and acceptance among the user states, we find them citing the fact that Project BEST is relying on field practitioners currently living the challenges of the new information technology on a day-to-day basis. This reality is useful in determining appropriate content areas for using technology as well as useful presentation formats and resource people.

This apparently ranks high among the states and no doubt accounts for the fact that BEST is viewed by the most enthusiastic states as a personal "people to people" professional exchange of "honest, no nonsense, down-to-earth" information and experiences in a "no frills . . ., no glossy packaging" format. It is being viewed as an information base of current experiences, which not only is talking about the new technology in practical terms, but also is using modern information technology itself to: determine precisely what information is needed; gather it; and make it accessible to those who can use it in a timely and effective manner.

Illustrative of specific reactions to Project BEST in terms of its usefulness to them are the following unsolicited comments states have provided to the central Project BEST office and/or to members of the Project's Advisory Board through letters, telephone calls, personal interviews and/or formalized feedback responses to Project queries.

Sample Comments from the States:

1. *Project BEST has helped to move us out of the Dark Ages when it comes to dealing with computers . . .*

   . . . all of the things kind of come together at the same time . . . pressure has been building to get micros into our departments.

   . . . state Superintendent on June 25 even said that he was embarrassed by their lack of knowledge re micros.

   . . . finally . . . next Tuesday . . . the State Board will get a briefing on Project BEST.

   . . . good, bad, or indifferent . . . if Project BEST had not happened, we would still be the only educational institution in our state without a microcomputer.

2. *It (BEST) is making us even more aware of our progress and the problems shared by other states.*

   We see Project BEST as being a great unifying force at the State in this transitional period of redefining State/Federal relations by pulling together disparate educational interests around a common set of problems and concerns. Consequently, Project BEST is very much ours to use and determine. It is the "soup stone" that at the state level becomes what we want to make of it. The ball is in our court.

3. *Project BEST's teleconferences are most timely and on target as to what is happening in our state. It is meeting our expectations. We as a State Team need to do more to channel BEST resources to our very specific needs. We currently are working on identifying and defining them. Our group is really enjoying the opportunities BEST is providing for teaching and learning from each other.*

   Your BEST NET electronic mail service and the problem-of-the-week bulletin board is a great idea. We are just realizing its value. It is illustrative of how the proverbial stone soup analogy really works.

   We are using tapes from the past teleconferences and the companion issues papers to run a series of state workshops. We greatly value the use of the technology to bring resource people like Robert Scanlon to us all on issues of great concern.

   If some states aren't finding BEST useful, don't blame yourself. It's their problem. They aren't adding the requisite ingredients to the Stone Soup.

4. *Our state is developing a teacher training package on the new technology and is relying on BEST resources and the use of the electronic mail system to identify issues and needs. We also are working out a small network of public and private sector people to explore ways of helping the schools to "get started" with the new technology.*

   . . . we regularly use BEST NET to check on upcoming meetings, conferences and publications. We are eagerly awaiting more of the video training materials BEST will develop from cross country site visits to schools.

   Also, BEST . . . now that it's fully operative and delivering services . . . needs to give greater attention to the basic skills dimension. We are eagerly awaiting this focus.

5. *BEST NET . . . what a good deal! We are demonstrating its usefulness to various groups in the states.*

   We know Project BEST is a difficult one to manage. Overall, it has certainly been useful to us to have the occasion of Project BEST to boost some of our state's activities and see that some of the people with real knowledge of school implementation are able to get plans and activities articulated before the bandwagon rolls over them.

6. *BEST is useful . . . it clarifies issues . . . provides guidance on pitfalls and organizational strategies. Good information . . . points out similarities of problems across the states . . . we're not alone.*

   BEST is helping us to assemble information regarding promising practices. We are also relying on BEST for our efforts in the development of a task force on instructional technology.

7. *It (BEST) is giving us some new ideas and strategies to use in our state. Also, potential sources to contact and much needed awareness of what others are doing.*

We are developing a series of Fall conferences for the schools on planning and implementation of micros in the schools. Also, in-service for SEA staff.

8. *Que maravilla . . . el Proyecto BEST! What a magnificent opportunity to enrich our teaching-learning approaches and to create a much needed network for professional exchange of experiences.*

9. *What a state gets out of BEST, depends on the STL's (State Team Leader) level of commitment and the support he/she gets from the top levels. . . Project BEST is a great source of insights and information as to what others are doing. It provides documentation to support and reinforce our goals.*

10. *BEST . . . it is helping to focus our own activities. The focus it provides perhaps is as useful as the content presented.*

11. *Project BEST is such a good opportunity. So sorry our state didn't see fit to participate. We are just now seeing the value and the need.*

As the preceding state comments suggest, the range of reactions to Project BEST generally have been positive, and the overall thrust of our efforts, information products, services and approaches is valued. Either as a result of Project BEST, or in tandem with the use of Project BEST information resources and materials, the States are developing a full range of activities for promoting the more effective use of the new technologies in the teaching of basic education skills and other areas of operation at the SEA and LEA levels. These include, as reflected in their State Plans submitted to BEST and their quarterly monitoring reports, staff development workshops and planning retreats, technical assistance efforts to the LEAS, computer literacy curricula, "hands-on" conferences with microcomputers, private-public sector cooperative agreements for promoting the use of the new technologies, long-term planning and legislative initiatives regarding a technology policy in education, the revamping of organizational structures at the state level for handling the technology challenges, and/or defining new staff line positions under the title of Educational Computer Specialist, Education Computer Consultant, etc.

Items most frequently voiced by the states as benefits they are deriving from BEST include:

- A resource which assists us to respond to school information requests and provide more realistic technical assistance to local education agencies
- The development of technology legislative proposals and policy statements
- An information base for making decisions on the utilization of block grant funds for technology
- A low-risk "hands-on" technology experience for specific and immediate problem solving activities
- An enjoyable way to develop appropriate levels of comfort for using the new technology
- The development of state-wide technology initiatives for education—e.g., computer literacy competencies, hardware/software evaluation guidelines
- The continuation of professional exchange and information sharing in a period of reduced travel budgets to visit sites and attend workshops, meetings and seminars.

Along with these more visible positive outcomes, the states also have voiced constructive feedback about the more salient operational difficulties and less than satisfactory experiences that they have had with the project. Constructive feedback has been voiced regarding televised production approaches and quality and technical problems associated with teleconference audio bridging services, and/or initial difficulties in logging on and accessing the BEST NET electronic mail services. This is to be expected in a cutting-edge effort making such widespread and varied use of the new information technology, while also pioneering new approaches and methods.

Project BEST staff is using constructive feedback of this nature to quickly make necessary adjustments and modifications to our services, while also incorporating these learnings into a more generalized set of experiences which can be shared more widely with other interested agencies, organizations and groups attempting to use similar mixes of media and technology.

Although we do not want to get caught in the cycle of trying to please or have *ALL* states "get something out of BEST," it is our feeling and philosophy that what a state gets out of BEST is directly proportionate to what they each put into it in terms of time, planning, motivation commitment and their particular defined needs for exploring the merits of the new information technology.

For such efforts BEST seriously tries to be "user-responsive" both to the needs of the 41 SEAs participating in a project BEST and to the requirements of our contractual obligations to the Department of Education. We, therefore, endeavor to underscore the following five principles of information dissemination and exchange throughout all Project efforts:

- Reinforce and build on the existing networks of educational agencies and professional organizations already committed to the improvement of basic skills teaching and technology applications, e.g., SEAs, intermediate education agencies, institutions of higher education, professional associations, Department of Education projects;
- Focus on *common areas of need* that these support organizations have, such as:
  - examples of modern information technology use
  - training (both pre- and in-service) strategies
  - guidelines for software evaluation and selection
  - on-going professional contact and exchange of experiences
- Provide functional experience, both good and bad, with the new information communication technologies so that participants can experience the benefits and generalize them to their own situations in a realistic way;
- Insure that the State Teams are composed of the varying forces within the State with a specific interest in instructional *improvement* of the basic skills and/or effective application of the new technologies;
- Keep in mind that regardless of where the technology has the potential to take education, we must start by viewing it within the context of the *current concerns* of teachers and administrators, which vary from state to state and even within a state.

LINKING THE NEW INFORMATION TECHNOLOGIES TO THE WORK OF STATE EDUCATION AGENCIES: A PROFILE ON PROJECT BEST

Henry T. Ingle*

The term *Technology-Exchange Transactions*, popularized by Rubenstein(1) and his associates at Northwestern University, describes a wide range of formalized procedures, technologies and information exchange activities aimed at increasing the knowledge and capacity of groups and organizations to better their use of promising new practices, techniques, procedures, methods and media.

This article presents some preliminary thoughts which my colleagues and I at the Association for Educational Communications and Technology (AECT) have developed for an ongoing technology-exchange transaction in education. The effort is known as Project BEST. The acronym BEST stands for Basic Education Skills through Technology. The *what, why, how, when* and *for whom* of Project BEST follows.(2)

PROJECT BEST: WHAT IS IT?

Project BEST is a cooperative effort being undertaken by AECT under contract to the U.S. Department of Education (Office of the Assistant Secretary for Educational Research and Improvement, Office of Libraries and Learning Technologies, Division of Education Technology). The project is entering its second and final year of operation. It involves a number of professional associations and Federal, state and local governmental entities working collaboratively to increase the knowledge base, the general level of awareness, and practical working experience about the use of an array of the new interactive information technologies for basic education instruction. The project's primary goal is to enhance the capacity of State Departments of Education (SEAs) to work cooperatively with Local Education Agencies (LEAs) in planning for and using new information technologies to improve the teaching and learning of basic skills.

It is expected that the project's information on these technologies and its telecommunications infrastructure for communicating this information, which emphasizes satellite video and audio teleconferencing, information storage and retrieval via the microcomputer, and problem solving and information sharing by means of electronic mail service, could serve as a model for the states. They may wish to implement similar technology-based information exchange efforts in other priority areas of education and/or in such program areas as health, human services, housing transportation, and energy. This possibility may become particularly important to states as the change from categorical to block grant Federal funding becomes fully operational and the states take a stronger leadership role in the planning, design and implementation of their various program priorities. In support of this leadership role, modern information technologies can improve both the effectiveness and efficiency of gathering and making accessible information needed for new programs and policies.

For this purpose, Project BEST is

(1) developing and assembling an array of cooperatively-produced information materials for use by states in assisting local schools to make effective and efficient use of technologies such as the microcomputer and the video-disc;
(2) serving as a "brokerage" or focal point among participating states for the exchange of the most current information on the role of this technology in basic skills instruction;
(3) providing opportunities for State Departments of Education to mutually support each other in the exchange of current information and practical experience concerning the use of these technologies;
(4) brokering opportunities for joint problem-solving on the use of these new media and technology for basic skills instruction.

Recognizing that states are at varied levels of sophistication with respect to their use of these new information media for educational purposes, Project BEST is providing information that will enable recipients to determine when and how to use media and technology in support of a number of administrative. management. project planning. training. instructional and information dissemination functions: to assess the relative advantages and disadvantages of their application in varying educational settings and for various pressing educational needs in areas such as basic skills instruction: and to establish their own guidelines for hardware and software selection and evaluation.

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The project is working through state teams composed of personnel from the basic skills. in-service training. and technology management units of their agencies. as well as other units state officials have designated. Strengthening the SEA's ability to utilize advanced telecommunications technology. and increasing their awareness of successful applications in the field is expected to enhance their efforts to reach out to local education agencies and schools utilizing these various new technologies.

A variety of products and information services are being developed and made available to the state teams for this purpose through Project BEST. These include

(1) modules of written and video materials on the use of technology in basic skills education. including materials to support planning. administration. and instructions;
(2) a series of video and audio interactive teleconferences to present information on successful applications in the field and to permit participants to interact with each other and to ask practitioners and experts questions about these activities; and
(3) a current information bank accessible through such means as an electronic mailbox. a toll-free telephone line. or regular mail that includes
    (a) information on upcoming conferences. workshops. seminars. meetings. etc. on basic education skills and or the new information technologies:
    (b) names of local educators and experts who can be contacted for assistance: and
    (c) bibliographic citations of recent materials on new communications technology. the use of technology in education. and the application of technology to basic skills education.

Target Audience

Forty-one State Departments of Education. including the State of Maryland. have been selected for involvement in the project. Each state has formed a state team of relevant individuals who can benefit from participation in the project and can contribute to the development of project materials and to the expansion of state capability to deal with educational technology. Each participating state. therefore. has assembled a team of the individuals most appropriate to its needs and organizational structure. Individuals representing the following units organizations are represented on these state teams

educational media technology services;
basic skills content areas;
dissemination. diffusion and innovation:
information and library sciences;
in-service training:
coordinators of special computer projects;
teachers associations: intermediate school districts: and
IHEs involved in pre-service and in-service teacher training.

Indirectly many other individuals will also benefit from Project BEST by being invited to attend one or several of the teleconferences conducted by the project and individuals who participate in subsequent SEA-directed training sessions that incorporate Project BEST materials. Thus. the project serves two different audiences: individuals who will serve as trainers and linkers. and professional individuals who will be the ultimate recipients of training and development efforts. The materials developed by Project BEST are being designed to respond to different needs of each target audience.

It should be noted that two other groups likely to benefit from Project BEST. although they are not specific target audiences. are the U.S. Department of Education and a number of professional associations that are cooperating in the project as members of an Advisory Board. Represented are the

American Association of School Administrators
Association for Educational Data Systems
Association of State Supervisors of Mathematics
Basic Skills National Technical Assistance Consortium/CEMREL. Inc.
College Board
Council of Chief State School Officers
Education Commission of the States

ERIC Clearinghouse on Information Resources
International Reading Association
National Association of State Educational Media Professionals
National Association of State English and Reading Supervisors
National Council of Teachers of English
National Council of Teachers of Mathematics
National Governors' Association
National Science Foundation
National Steering Committee of Basic Skills Coordinators
National Council for Accreditation of Teacher Education

Expected Project Outcomes

Direct outcomes of Project BEST can be expected at both the state and national level. At the *state level,* there will be

expanded knowledge of the information resources, including knowledge about hardware, software, and experts available at the state level to assist LEAs and schools in the selection and use of technology for basic skills education;

a team of SEA experts who can provide technical assistance and training as required by and for LEAs and school personnel;

an *information base* that can enable the states effectively to use block grant funding to support project planning for basic skills education and purchases of technology;

a series of *positive experiences* in the use of technology for cooperative planning and in-service training according to the individual needs of each state;

familiarity with techniques and materials that rely on technology for use in in-service training programs; and

a series of written *training materials* with supplementary audio and video modules collaboratively developed with the states for use by interested SEAs and LEAs.

At the *national level,* an electronic network of information resources is being made available on technology-supported education in reading, communication skills, and mathematics. It is also expected that the network of states and professional associations directly involved in the project will provide an on-going link among these organizations to support a continuing exchange of ideas, information, and readily usable products emanating from the project. Other project outcomes include the following benefits and changes.

State Level

Increased *visibility* of the SEA as a resource for information on the use of technology in basic skills education;

Planned *uses* of the project materials in future SEA-sponsored training programs;

Positive effects of the project on the use of technology in basic skills education in the state and on the *quality* of basic skills education;

Increased *perceived utility* for technology in education;

Institutionalization of the process, including:

Plans for continuation of the state team expertise after the expiration of the project;

Plans to use a similar team approach within the SEA for other priority areas;

Plans for continuation of the developed information resources after the expiration of the project; and

Plans to apply a similar Federal-SEA technology model in other areas of education and/or other state priority areas.

Federal Level

The Department of Education will have a practical example of

a functional State-Federal *partnership* based on some of the evolving changes in leadership roles brought by changes in Federal funding patterns;

a relationship fo *decreasing dependence* on the Federal government as project services become part of the regular support that associations and SEAs could provide to their constituents;

a *model* of *appropriate Federal support* of state government, one in which the government provides the mechanism that allows states to conserve their resources by ongoing exchange of functional information:

a *demonstration* of the intention of the U.S. Department of Education to be an *advocate* of modern technology applied to local problems.

Professional Associations

The associations whose members relate directly to basic skills teaching (NCTE, IRA, NCTM) and instructional technology (AECT, NASTEMP, AEDS) will benefit in the eyes of their dues-paying constituents if they can provide appropriate and relevant answers to concerns about technology's role in improvement of basic skills.

Their interest, therefore, in working with BEST is that membership of the participating professional associations will have access to services that have been defined and developed with their needs in mind; participating professional associations will have developed the capability to provide similar support to their memberships after the end of the project.

PROJECT BEST: ITS RAISON D'ETRE

To summarize the relationship of Project BEST to its goals and outcomes, one must start with the "end" conditions which have prompted the project and the situation it is intended to influence. At the local level, it is no longer a question of "whether" schools should use technology. The microcomputer and related video communication technologies have arrived, their numbers are increasing geometrically, and schools are actively seeking to find out *how* to use them.

The Department of Education funded Project BEST to help respond to those current needs. Recognizing the uniqueness of each state's situation, the Federal government is interested in working with the states in a transition role to help them develop or expand their capacity to assist local education agencies and schools, and in the process cooperatively work toward defining leadership responsibilities being brought about in part by the "New Federalism" and changes in the schools. This capacity includes specific skills, knowledge, and relationhips necessary to respond to local needs, such as examples of effective use of microcomputers for basic skills improvement, and continuing access to information resources.

To develop this capacity, each of the forty-one participating state sites has the opportunity to be part of an interactive telecommunications network in the development of staff training and support materials they will ultimately use. These materials include videotaped examples of effective instructional and administrative uses of the new technologies and access to a bank of related information resources useful to the planning and utilization processes.

As part of this materials development effort, Project BEST is working closely with the national professonal organizations that represent the practitioners most concerned with basic skills improvement and technology. Thus, when the project is completed, the state practitioners will be linked to the peer groups to which they normally turn at the national level for assistance. It is envisioned that these associations will be able to provide the continuing support that the states need as they respond to changing local needs and evolving new Federal/State roles in education.

Project BEST, in one sense, therefore, can be seen as a response to a set of separate, but related, trends in current educational practice. Among these are increased concern for achieving basic skill competencies in elementary, secondary, and adult student populations; the desire to use technology, especially the new information technologies, such as the microcomputer and video technologies, to more effectively and efficiently teach such competencies; and the emergence of new roles for state agencies resulting from recent changes in Federal, state and local government relationships and funding arrangements.

PROJECT BEST: WHAT ARE ITS PRINCIPAL COMPONENTS?

Project BEST, as an information dissemination project, is best understood with the context of the decisions facing schools today and the types of information needed to support those decisions.

Quite simply, much in our educational milieu is changing. Once-appropriate relationships, priorities and assumptions are being questioned. Moreover, the particular information technologies with which we are concerned are in a state of rapid development and corresponding change. Decisions made in an environment like this are "risky," yet they must be made. In many cases, what is not available to the educational decision-maker today is *knowledge*. The best that can be used is *information* and thus the more *current* and *comprehensive* it is, the better.

In this context, Project BEST is disseminating *knowledge in the process of being developed*. This is possible today only because the new information technology provides the interactive links to gather and provide access to that information within realistic and practical costs and time frames. Project BEST, therefore, can be viewed as an *information base of current* experiences related to the improvement of basic skills teaching with technology. It employs *modern information technology* itself to (1) determine current needs for information; (2) gather it, and (3) make it accessible to those who can use it.

Briefly, the information technology components of Project Best are

(1) *Four audio and four video teleconferences* (each about ninety minutes)—each teleconference covers key topics and issues which are of prominent concern to state education agency personnel regarding the use of technology in education. The Confersat network of the Public Broadcasting Service (West Star Satellite IV) is being used. As Project BEST moves into the remaining twelve months of its work, a calendar of activities has been set for the teleconference component, which will be supplemented through the BEST NET electronic mail system, audio conferences, print materials and pre-recorded videotaped modules. The *video teleconferences* will involve participating states in a series of interactive discussions transmitted via the PBS Confersat system. A kick-off to the effort was spearheaded by the Secretary of Education's National Technology Telecast on June 22, succeeded by the following interactive teleconferences:

October 27, 1982
SEA Organization for Effective Use of Technology in its Own Work and to Promote Use in Schools

January 24, 1983
Practices and Examples in Planning, Introducing and Implementing the New Technologies in the Classroom by Basic Skills Content Areas—Including Equity Issues, Financing, and Private/Public Sector Cooperative Arrangements (also to be received at Commtex AECT Convention in New Orleans)

March 29, 1983
Teacher, Administrator and Parent Literacy in the New Technologies—Illustrative Examples, Issues, Concerns and Promising Approaches

June 28, 1983
Guidelines in Software/Hardware Selection and Evaluation—Who's Doing What, How and With What Effects?

(2) *Videotape case studies*

These videotapes document the key experiences of school practitioners who have been using microcomputers and related video technology effectively in basic skills education. They are short, organized in a manner that will allow variations in use, and will not become outdated in a short time.

Each video module is being designed for an audience of *adults* who work in or with education, seeking information from *others in stiuations similar to theirs*. On such topics as what the technology allows them to do or accomplish; what's involved and *how* they handle it; how they feel; what didn't work and what they learned from it; what constraints they had to deal with and how; Project BEST will produce four videotaped modules responding to these concerns.

(3) *An electronic information system including electronic mail and bulletin board services*

Each of the participating states feeds into this communication system information of a practical nature on the use and application of the new information technologies in their own state, including problem-solving approaches experienced by local school districts and SEA staff. Also included is a comprehensive vertical file with references on microcomputer software development and evaluation sources and information on exchange possibilities.

Of all the media Project BEST will be utilizing, electronic mail may be the one that is least familiar to most participants. Simply stated, electronic mail is a central computer that allows individuals in a prescribed network to send and receive messages to and from each other. Messages are "sent" but not delivered until the recipient requests them. In addition the system allows an unlimited number of "bulletin boards." These are usually lists of information that is stored and made accessible on-call to anyone wanting to read them. (e.g., listings of new publications, announcements of upcoming meetings, etc.)

Research suggests that after the initial novelty wears off, there is usually a decline in usage of electronic mail systems and that the technology should be matched to appropriate organizational tasks, rather than indiscrimately thrust into all communication activities. This makes sense. Most professionals are not accustomed to operating in a style where they can interact with peers at other institutions on a regular basis. As much as they think they might like to do this, few make it a regular practice when given the opportunity. It can be a burden on others; one can appear dependent and unknowing; and it might take too much energy to describe to others just what you are looking for.

Project BEST is playing a "pump-priming" role for the electronic mailbox. We shall be asking questions that require responses and giving state teams reasons for contacting each other and us. The electronic bulletin boards we are maintaining are the states' primary access to the most current information in two areas—*forthcoming meetings* and *current* related articles. We will also use it to maintain an experience exchange around the problems of managing support services between SEAs and LEAs. One mode is a Problem-of-the-Month in which solutions are being solicited by electronic mail messages and displayed on a special bulletin board. Users of the system then react to the problem by providing approaches or solutions they have used and/or sharing experiences about similar types of problems.

For Project BEST, a network for electronic mail has been established with a mailbox address for each State Department Team Leader and the Project. Team leaders provide their own video terminal and telephone connection (a telephone and modem) to send typewritten messages to the BEST project office and to each other. The Project furnishes the network and about two hours of use time per month for each site.

(4) *Data Bases*

Project BEST will develop four data bases that will be accessible through electronic mail, toll-free telephone calls, or by mail. These include an information bank of print and nonprint resources on basic skills and technology; an exchange on microcomputer software information; a directory of regional pools of experts; and a collection of supplemental materials developed by the Project to facilitate use of the services.

Information Bank: Project BEST houses a reference and referral collection including a bibliographic source list and a collection of print and nonprint reference materials. This information bank supports state capacity-building needs, and through them, local needs for current information on materials, media and methodology. Materials and resources cited include current practices on teaching basic skills (reading, mathematics and communications) and on utilizing modern communication technology (hardware and software) that supports basic skills education (including telecommunications, computers and interactive video/audio systems). These data bases are being developed collaboratively with the national offices of the basic skills professional associations represented on the Project BEST Advisory Board. Input from participating state teams also is being solicited to assure that the information bank remains current and comprehensive. In this manner the data base can provide information to address educator needs and at the same time keep Project staff apprised of current programs, methodologies and effective strategies.

Microcomputer Software Exchange: The microcomputer software exchange is a mechanism for sharing information both on the growing number of teacher-produced microcomputer programs and information on commercial microcomputer programs in the teaching of basic skills. Project BEST will facilitate the exchange of information on microcomputer programs dealing with the teaching of basic skills, public-domain programs, and link interested users to bibliographic listings of commercially-produced software for basic skills teaching. It will also provide status reports on promising selection and evaluation guidelines.

Regional Pools of Experts: The Project is developing a list of individuals and organizations, identified by the states as having experience and expertise relevant to technology and the teaching of basic skills. The Project will develop a simple format for states to use in providing brief indexing data on the persons in each state's file. After BEST has aggregated the various state indexes into regional or subject pools of expertise, the listing of experts will be accessible to SEAs from BEST's information service. Requestors then would seek additional information from the appropriate

SEA. After completion of the Project, the index to current expertise can be maintained by state or regional organizations.

Supplemental Materials: As an outgrowth of other information services activities, the Project is developing supplemental materials—three print products—to facilitate the use of the services and to catalog its holdings. Sources will include AECT publications and accumulated knowledge, information learned in the project's design phase, and input from cooperating organizations and SEA teams. The three products are

a. *How to Select Technology* - a brief guide to help users select appropriate technology for their own needs;
b. *How to Evaluate Microcomputer Software* - a guide to selecting and evaluating software; and
c. *"Promising Ideas and Practices" in Using Technology To Teach Basic Skills* — a series of occasional papers giving case studies across the nation where technology is being used effectively and imaginatively to improve basic skills learning.

The project will provide camera-ready copy of these materials to the state teams for duplication and dissemination to the LEAs.

(5) *A toll-free telephone hot line*

Project BEST is establishing a telephone "hot line" to respond to inquiries of a more urgent nature from participating states on given technology issues in basic skills instruction. This hot line was scheduled to become operational in October 1982.

In summary, Project BEST's information technologies both undergird and enhance the networking, services, and training activities of the project. All three phases interrelate to serve one purpose: building the capacity of the SEAs to support appropriate uses of technology in basic skills teaching.

The intent is to facilitate the exchange of resources (information and expertise), establish a process for accessing the hard-to-get-at knowledge and experience that reside among individual teachers and educational administrators, and create a mechanism for sharing information directly among the states. The information services are structured in such a way as to reinforce the SEA professionals' visibility as the source of information and assistance. Therefore, these information services can be continued without Federal support after the Project ends, through the cooperation of SEAs and the participating professional associations with a vested interest in maintaining these resources.

In carrying out the scope of work for Project BEST, the Association for Educational Communications and Technology has entered into contractual arrangements with the Maryland Instructional Television (MITV) Division of the Maryland State Department of Education, and with Applied Management Sciences, Incorporated (AMS) a research consulting firm in Silver Spring, Maryland. The MITV staff is responsible for the production of the video teleconferences and the pre-recorded videotaped modules presented during each teleconference.

WHAT WE EXPECT TO LEARN FROM PROJECT BEST

The two most significant trends in federal-state relations with respect to education are (1) a general reduction in the amount of Federal funding for education programming; and (2) the replacement of categorical programs with block grants. These two developments will have important effects on education. Both trends lead in the same direction—that is, increased competition among different educational programs. Instead of having monies earmarked for their use only, programs will have to compete against each other for a piece of the smaller pie. Educational activities favored by the general public will, therefore, have a comparative advantage. In this regard, the basic skills area may have an advantage so long as the competency of secondary school graduates and, by extension the adequacy of the schools which produce them, remains a salient policy issue. To the extent that new educational technologies contribute to this comparative advantage, they will be viewed as an ally.

A second effect of block grants is to alter an array of established relationships that have been woven around categorical programs, each of which has its own network of service providers and users, interest groups, legislative sponsors and professional associations. The move away from categorical funding will disrupt patterns of interaction at the national, state and local levels that have provided much of the peer support necessary for improvement efforts.

Continued progress in basic skills instruction and increased use of technology in that effort require that the states adjust to these trends in federal-state relations by developing new roles. It is particularly important that a state be able to coordinate its planning for basic skills improvements in all curriculum content areas, and to have the data and skills to broker the exchange of information on exemplary practices, implementation experience, expert consultant data banks, etc.

IMPLICATIONS FOR PROJECT BEST

If the above contexts represent "the world as it is," then Project BEST is indeed timely and useful because it *reinforces* and builds on the educational agency and professional organization *networks* already committed to the improvement of basic skills teaching, e.g., SEAs, intermediate education agencies, institutions of higher education, professional associations. It focuses on *common areas of need* that these support organizations have, such as examples of modern information technology use; training (both pre- and in-service) strategies; guidelines for software evaluation and selection. It provides *functional experience* with the new information communication technologies so that participants can experience the benefits and generalize them to their own situations. It insures that the state teams are composed of the varying forces within the state with a specific interest in instructional *improvement* of the basic skills. It keeps in mind that regardless of where the technology has the potential to take education, we must start by viewing it within the context of *current concerns* of teachers and administrators, which may vary from state to state and even within a state.

Project BEST is building on these experiences and lessons in an effort to strengthen the capacity of State Education Agencies (SEAs) to set in motion a new approach to dissemination and the exchange of information technology. These ends will be accomplished by outlining and defining a set of approaches, people networks, information resources, data bases, and technology facilities to support Project BEST training and technical assistance requirements. Project BEST emphasizes a set of approaches that are very personal in nature from the viewpoints of both the recipients of the project's services and of the providers. This approach is grounded in a number of principles and lessons emanating from research on dissemination and practice improvement.

Project BEST's approach to dissemination has incorporated components from what the research literature and practice has identified as successful information and technology transfer experiences. It is a user or need-oriented exchange. It provides users with extensive two-way interactive opportunities. It builds on existing people networks for information exchange. It provides access to information materials that are usable—that is, provides information receivers/users with materials and products that have a life of their own and can be directly applied to a practical setting with little or no adaptation.

The soundness of these guiding principles also is underscored in the project BEST rationale which builds on the many and varied technology-based educational change projects since the late 1950's. It is clear that the real innovation and success factor in these projects was not the particular technology (e.g., television, programmed instructions, etc.) but rather the *planning and utilization process* that the technology required. This common factor in successful innovations (1) brought educators *together* to *identify problems* and plan for their resolution; (2) allowed them to develop a sense of control over part of their working environment (most projects required systematic management); and (3) let them see *results*. Thus, these processes of involvement helped educators meet personal psychological needs that are not adequately met in the usual routines of teaching and administration.

It is also clear from the experience of the past two decades that you cannot directly "sell" changes in the psychological and social processes of the school on a widespread basis. They are seen as frills. For this reason, it is important that the project participants maintain a perspective that keeps its products, services, and processes in proper alignment, with the focus always on the tangible products and services.

As for the approach to the "concept" of technology, the foregoing suggests that it be very *simple* and *practical*. Project BEST, as such, views the SEA staff members (and the eventual LEA personnel) as practitioners who face daily problems in managing their resources to accomplish their purposes (as we all do). "Long-range improvement" and similar goals only make sense when they start from this jumping-off place. It deals with "modern information technology" as *tools* that can be used to address these ongoing management problems. We know technology has other appropriate dimensions (preparing students for a technological society; technology as "hardware," as "software," technology as a "design process," etc.) but these can blur the distinction necessary for an individual to see it in relation to his her own immediate, specific ends. It emphasizes that there are a lot of reasons why schools *should* use technology and we have had them for twenty years. The issue is not whether these are valid reasons but rather the way they are presented. Being told what one "should" or "ought" to do can be a tremendous barrier to doing what one *can* do. These "shoulds" are usually broad *goals* that cannot be attained through simple actions. Thus, the practitioner is immobilized as she he realizes that a desirable goal would require complex actions over which she he has little or no control.

Project BEST also wants to be realistic about the experience with technology that project participants will bring and or take away with them. One of the biggest barriers to acceptance of technology is the assumption (expressed by those who promote and sell technology) that the reason to use it is that if you do it right, "it works without a hitch." Yet this runs counter to the almost universal experience that things frequently don't work smoothly (from space shuttles, to cars, to film projectors). We need to let the participants know that *their* experience is *right;* and that the reason to use technology is not because it will bring perfection, but because it can allow them to accomplish something that is *important* to them. Only against this criterion do the "problems" of technology use become worth it. In other words, technology does not always work the way it is supposed to . . . but people don't either. In the latter case, we assume the fallacy, allow for it, and make adjustments when it happens. Consequently, we should show technology in fallible and infallible settings and prepare users to expect things sometimes to go wrong, as Murphy's Law indicates.

The Project BEST perspective on technology, therefore, will try to keep in proper relationship the several interrelated decisions that have to be made before effective technology-suported teaching and learning can take place. The decision to *use* technology often is perceived as a *trickle-down* process. Because capital expenditures may be involved, those who make the major resource decisions—administrators and boards—usually are seen as the "gate-keepers." These decisions, however, only provide the hardware and software. The primary decision to use technology does not trickle down or up. It is made by the classroom teacher *each time* she/he weighs the needs of the student against the resources available for meeting them. It involves not only needs and resources, but also the teacher's own purposes, role, and needs.

For these reasons, video portions of Project BEST's teleconferences on what schools are doing with technology are being designed to be forthright, candid, and honest about the *learning* that is taking place in each of these schools. The hardware does not come with a built-in set of "best-uses." These have to be *discovered* by teachers through a trial and error process. Thus, we plan to have the educators on the tapes talk about the problems they had and are having, what worked and what did not, and play up the *challenge* of discovering how to be a more effective professional.

The basic strategy for Project BEST, therefore, is underscored: to work cooperatively with existing national professional associations and with State Education Agencies (SEAs) to strengthen their own stated needs to encourage and support the use of telecommunications technology in the teaching of basic skills.

The project is also endeavoring to bring together currently scattered resources and efforts to use technology to teach basic communication and computational skills.

Through sharing of knowledge being developed nationally in the states, direct participation in the shaping and development of training materials, and provision of modular materials and interactive modes of accessing information resources of use to states, Project BEST can offer state educational agencies a wealth of information and ideas to support state in-service training and technical assistance to schools. To this end, Project BEST underscores an approach that relies upon building state teams comprised of basic skills curriculum specialists and technology professionals who can ultimately plan and be the linkers who direct specific states' efforts. This approach requires participating states to commit the time and resources needed to make project materials useful within the context of their own environment, current needs, and operating structures.

Thus, Project BEST is an information resource *providing* an *opportunity* and a *reason* for states to communicate with and learn from each other. As such, it is and will be *only* "what each participating state decides to make of it."

References

[1] Rubenstein, Albert H. *Designing Organizations for Integrating Technology Exchange Transaction.* Northwestern University, January, 1976.

[2] Ingle, Henry T. and Rhodes, Lewis A. *et al. Project BEST: What, Why, How, When and For Whom. A Project Planning, Design, and Implementation Document.* AECT, Washington, D.C. January, 1982.

[3] The author is particularly appreciative of the assistance and insights provided by Lewis Rhodes, Carol Baker, and Cheryl Petty in the development of this last section of the article.

FINAL PROJECT BEST TELECONFERENCE

JUNE 30, 1983

Objectives

This final Project BEST teleconference was transmitted in two parts with a 15-minute break in between on June 30, 1983 over the PBS Confersat Network. Part I was a 45-minute segment entitled "Microcomputers in the Classroom: Applications, Selection, and Evaluation." It was followed after the break by another 45-minute segment, "The New Information Technology in Education--Continuing State Roles." Both hours of the teleconference included a two-way video segment with resource personnel at KVIE in Sacramento, California electronically joining Project BEST staff and invited panelists at the Maryland Instructional Television studios in Owings Mills, Maryland.

The first part of the teleconference was designed to:

- define and clarify issues pertaining to the selection and evaluation of hardware and software and the application of microcomputers in the classroom;
- provide viewers with ideas about the purchase and use of microcomputers through discussion and screening segments of the last two in a series of four 30-minute video modules prepared by the Project BEST staff. The modules are entitled "Teaching WITH Computers: What Can I Do?" (Module #3) and "Computer Wares: Hard and Soft Decisions" (Module #4); and
- allow teleconference participants the opportunity to call in questions relating to these topics for immediate feedback from an assembled panel of experts.

The second half of the teleconference was designed to:

- share the technology plans and experiences of five states participating in Project BEST that are illustrative of the type and range of new technology efforts being undertaken at the state level throughout the country;
- introduce and explain the Users' Guide to Project BEST Products: Print and Non-Print, which was developed by the staff to facilitate the use of Project BEST materials; and
- sum up the learnings and experiences of Project BEST over the last two years in areas relating to telecommunications and video technologies.

Users of the Videotape

These two video modules referenced above are useful for both state and local administrators who need practical information and guidelines for selecting and evaluating hardware and software. They also suggest ideas for ways in which microcomputers can be used in the classroom as instructional tools.

Content

Part I: Microcomputers in the Classroom: Applications, Selection and Evaluation

This first hour of the June 30 teleconference featured a resource panel of experts in the area of instructional computing. The panel included:

- LeRoy Finkel - Instructional Computing Coordinator, San Mateo County Department of Education, Redwood City, California
- Beverly Hunter - Senior Staff Scientist, Human Resources Research Organization (HumRRO)
- Pristen Bird - Instructional Computing Consultant, Educational Technology, Florida Department of Education
- Charles Philipp - Instructional Computer Analyst, Montgomery County Public Schools, Rockville, Maryland

Cheryl Petty Garnette of Project BEST moderated the panel's discussion during the first hour on issues relating to the selection and application of microcomputers at the K-12 school levels. Short clips from the two video modules framed the discussion topics. The panel noted the lack of research in this area and stressed the need for cooperative arrangements between SEAs and LEAs in the form of microcomputer clearinghouses and demonstration centers to provide awareness to educators making decisions about the purchase and use of micros in the schools. The role of industry was also mentioned in discussion of the Apple Bill and legislation like it. Software and the various programming languages were brought up in relation to their relevance to the various curriculum areas. Questions from the participating states were called in on the air and the panel responded to and discussed issues raised by callers. Lew Rhodes of Project BEST provided instant analysis and summary of the panel discussion for this first half of the teleconference.

Part II: The New Information Technology in Education--Continuing State Roles

Henry Ingle and Carol Wolinsky of Project BEST facilitated the second hour of the June 30 teleconference, which examined the technology initiatives and activities of several states participating in Project BEST. Among the states featured in this segment were Ohio, Vermont, Tennessee, California, and the Commonwealth of Puerto Rico. Phil Daro, Manager of the Technology Division at the California State Department of Education, appeared live via satellite from the studios at KVIE-TV in Sacramento to talk about technology centers, state legislative and policy initiatives, and other activities at the California SEA.

Leroy London of Project BEST, along with Carol Wolinsky, presented a short segment on the Users' Guide to Project BEST Products: Print and Non-Print, highlighting various portions of the notebook and explaining its components.

In this last portion of Part II, Henry Ingle, Lew Rhodes, and Frank Batavick discussed the learnings resulting from their experiences with teleconferencing over the last two years with Project BEST. Lew Rhodes noted that teleconferencing is a tool to be used only when there is a need for it--something specific to be said or some defined task to be accomplished. Frank Batavick, Executive Producer for all BEST teleconferences, reviewed the various techniques explored by the Project in its four teleconferences and commented on the "talking head" controversy associated with teleconferencing. Henry Ingle further discussed the cost effectiveness of the teleconferencing medium, the vast numbers of people that can be reached through it, and the amount of staff preparation and lead time it takes to prepare a teleconference. The three then took a brief look at what future teleconferences might bring--i.e. 3D, holigraphics, smell, etc.

Pre-Viewing Activities

Before viewing the teleconference, it may be useful to view the two accompanying video modules that are the basis for the teleconference topics--"Computer Wares: Hard and Soft Decisions" and "Teaching WITH Computers: What Can I Do?" They present background information and suggestions for viewers to consider when thinking about evaluating various brands of hardware and software and using microcomputers in the classroom. It might also prove useful to read the learnings paper prepared by Lew Rhodes and the Project BEST staff, Video as a Medium for Sharing Experiences. The learnings paper is included in the Project BEST Products notebook.

Post-Viewing Activities

Discussion activities for following up on the teleconference may be broken into two areas: (1) the comparison of different types of hardware and software and how their selection is influenced by specific applications of the technology in the curriculum; and (2) the viewers' technology plans already in place as contrasted with the experiences of other states, schools, or school districts.

Questions to consider pertaining to the first part of the teleconference might cover:

- What elements/features are important in selecting or evaluating hardware and software for use in your state, school or school district?
- How will you deal with issues such as maintenance, obsolescence, staff development, and security?
- In which curriculum areas would microcomputers be most effective? How can they be integrated into the curriculum to be used as instructional tools? As administrative/management tools?
- How can your state, school, or school district move from teaching ABOUT computers to teaching WITH computers?

The second half of the teleconference may raise questions such as these:

- What have you the viewers learned through your experiences with educational technology that may be of use to others? How can you effectively share this information with them?
- What kinds of information would you find most useful to share with colleagues currently involved in the area of instructional computing? What is the best medium for exchanging ideas--i.e. newsletter, videotape, telephone, in-person meetings, etc.?
- How can your state, school, or school district build a network of human resources to avoid "re-inventing the wheel"?

Resources

For more information on teleconferencing, refer to the Users' Guide to Project BEST Products: Print and Non-Print and the learnings paper prepared by Lew Rhodes, Video as a Medium for Sharing Experiences, which is included in this Users' Guide notebook.

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American Association of School Administrators

Association for Educational Data Systems

Association of State Supervisors of Mathematics

Basic Skills National Technical Assistance Consortium/CEMREL, Inc.

The College Board

Council of Chief State School Officers

Education Commission of the States

ERIC Clearinghouse on Information Resources

International Reading Association

National Association of State Educational Media Professionals

National Association of State English and Reading Supervisors

National Council for Accreditation of Teacher Education

National Council of Teachers of English

National Council of Teachers of Mathematics

National Governors Association

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